COMPARATIVE MODALITIES OF NETWORK NEUTRALITY

by

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Under the Direction of Shawn Powers

ABSTRACT

This project examines the ongoing debate over internet content discrimination, more commonly referred to as network neutrality. It offers a new approach to examining this issue by combining a critical, political economy approach with Lawrence Lessig's four modalities of regulation: policy, architecture, markets, and norms. It presents a critical, comparative case study analysis of how architecture, markets and norms have shaped United States policy along with comparative examples from select international case studies facing similar regulatory issues. Its findings suggest that while each of the four modalities plays a significant role in the regulation and persistence of network neutrality, there is a need for more clear, robust policy measures to address content discrimination online. Based on these analyses, the author offers policy recommendations for future network neutrality regulation.

INDEX WORDS: Network neutrality, New media technology, Information communication technology, Internet infrastructure, Open internet advocacy

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DEDICATION

Dedicated to my loving wife Lauren and in memory of her mother Becky.

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TABLE OF CONTENTS

LIST OF FIGURES

1 INTRODUCTION

On January 14, 2014, the U.S. Court of Appeals for the District of Columbia ended the U.S. Federal Communications Commission's (FCC) latest attempt to enforce Network Neutrality (NN), a principle that urged network providers to treat all digital content equally.[1] The FCC's rejected policy, the 2010 Open Internet Order, mandated providers disclose their network management practices and prohibited blocking or discriminating against lawful content on their networks.[2]

The court's ruling in favor of communications giant Verizon was based primarily on the FCC's previous classification of internet services as different from and therefore not held to the same standards as telecommunication services (e.g. telephone) and therefore not held to the same standards.[3] Because of historical threats from monopolistic abuse at the hands of providers like AT&T, many previous communication services were protected as common carriers for nearly a century.[4] The principle of common carriage (with a history stretching as far back as ancient Rome) refers to the obligation of transportation information networks serving a vital connecting role in society to treat content equally.[5] But despite travelling on the same or similar infrastructure as telephone, network owners have argued information services like the internet be considered different, which, in practice means less oversight and more opportunities for abuse. As internet protocol services, content, and networks increasingly play a central role in modern society the equal transportation of information across these networks must be insured, either by legal rulemaking or through other means of regulation.

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[1] Wyatt, "Rebuffing F.C.C. in 'Net Neutrality' Case, Court Allows Streaming Deals."
[2] Federal Communications Commission, *In the Matter of Preserving the Open Internet Broadband Industry Practices*.
[3] "Sender-Side Transmission Rules for the Internet."
[4] Wu, *The Master Switch: The Rise and Fall of Information Empires*.
[5] Ibid.; Marsden, *Net Neutrality*.

In the wake of the 2014 ruling, NN supporters have been eager to cast blame for the issue's lack of support. Neutrality advocates have criticized the FCC's piecemeal approach, the consolidation of the telecommunications and media industries, and a lack of political attention paid to internet issues in general.[6] Meanwhile, the FCC led by chairman Tom Wheeler has worked to outline a revised set of policies to guide the FCC's enforcing of an "open internet." With the FCC's previous policy invalidated and the status of network neutrality in limbo, the need for examining the issue and potential policy directions is greater than ever.

In this pursuit, I will argue the need for network neutrality, describe its major participants and acknowledge the major works examining the topic so far. This chapter includes offers a theoretical lens for examining now network neutrality is regulated as well as the purpose and methodological design for this project in general. Finally, it includes a guide to the subsequent chapters of this thesis.

1.1 The need for neutrality

While feckless FCC policies and the powerful financial lobbying and political influence of network owners have drawn much of the blame for the weakening of network neutrality in the U.S., the historical, commercial, technological, and social factors surrounding the issue have arguably played a larger role in the current state of network discrimination both in the U.S. and around the world.

Access to communication and information networks offers individuals powerful opportunities to contribute and participate in public life. The concept of network neutrality is designed to protect these opportunities.[7] The internet offers shortcuts to people and ideas from around the world while also bridging previously immense distances between those in power

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[6] Patel, "The Wrong Words"; Herrman, "Welcome To The Net Neutrality Nightmare Scenario."

[7] Zittrain, *Net Neutrality as Diplomacy*, 23; Nunziato, *Virtual Freedom*; Benkler, *The Wealth of Networks*.

and the rest of the public.[8] The public's ability to share information and data offers opportunities to cultivate public discourse and share information, however network operators have continued to seek control over whom and what can be transmitted across the internet. Recently, a tenuous balance of policies and other mechanisms has existed to preserve access and equal treatment online. The 2014 Verizon ruling is just one demonstration of the frailty of network neutrality policies in the U.S. As these regulatory means are weakened, there is a need for more robust and effective policies to protect neutrality.

In this project, I examine how the markets, laws and architecture of the internet have failed to maintain a reasonable level of network neutrality in the U.S. By highlighting these failures in contrast to other approaches to net neutrality from around the world, I argue for more robust policy principles to address fair, reasonable and non-discriminatory information carriage across the web moving forward.

1.1.1 What is Network Neutrality specifically?

Network Neutrality's broad significance and complex nature has attracted scholarly attention from a wide range of fields including: communication, media, law, economics and computer science. Law professors Mark Lemley and Lawrence Lessig introduced the concept of non-discrimination for digital computing networks in 2000.[9] They argued, the "end to end" (e2e) design of the internet, in which information moves between users and without interference from network providers was vital to innovation.[10]

The term "Network Neutrality," first coined by legal scholar Tim Wu in 2003, builds on this foundation and the most basic sense describes the principle of preventing of digital content and service discrimination by Internet Service Providers (ISPs) and other network owners

[8] Kelty, "From Participation to Power."
[9] Lemley and Lessig, "The End of End-to-End."
[10] Ibid., 5–7.

across mass digital networks – namely, what is popularly considered the internet.[11] Legal scholar Christopher Marsden's 2010 *Net Neutrality: Towards a Co-Regulatory Solution* intervenes in the debate by offering an approach to neutrality that reconciles the industrial and political differences over the issue of neutrality.[12] Other significant legal scholarly contributions include those by Barbara Van Schewick, Eli Noam, Jonathan Zittrain, and others who have argued for NN based on its economic feasibility, the structural / industrial conditions which have led to its emergence and neutrality's implications for speech and information diplomacy respectively.[13] Some scholars, including Robert Hahn and Scott Wallsten, Jay Choi and Byung-Cheol Kim and Nicholas Economides and Joacim Tåg, focus on economic analyses offering descriptive and hypothetical modeling of the implications of neutrality.[14] Another strand of research focuses on the technical and infrastructural dynamics of neutrality, including: examinations of the technical means of data management by Milton Mueller, the technical feasibility of neutrality by Jon Crowcroft, and an in-depth investigation of the underlying protocols which make internet traffic possible by Fenwick McKelvey among others.[15]

There have been some investigations analyzing and comparing intentional approaches to the issue, such as those by Wallsten and Stephanie Hausladen, comparing the status of neutrality in a handful of example countries.[16] Marsden as well as Pietro Crocioni and Martin

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[11] Wu, "Network Neutrality, Broadband Discrimination," 20.
[12] Marsden, *Net Neutrality*.
[13] Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*; Eli M. Noam, "Regulation 3.0 for Telecom 3.0"; Noam, "Beyond Net Neutrality"; Zittrain, *Net Neutrality as Diplomacy*; Zittrain, "What Matters in Net Neutrality."
[14] Hahn and Wallsten, "The Economics of Net Neutrality"; Choi and Kim, "Net Neutrality and Investment Incentives"; Economides and Tåg, "Network Neutrality on the Internet."
[15] Mueller and Asghari, "Deep Packet Inspection and Bandwidth Management"; Crowcroft, "Net Neutrality"; Pouwelse et al., "Pirates and Samaritans"; Moustafa and Zeadally, *Media Networks Architectures, Applications, and Standards*; McKelvey, "Ends and Ways."
[16] Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks."

Cave have highlighted some of the neutrality conditions in the European Union, while Jeffrey Blevins and Leslie Shade compared the US neutrality conditions to those in Canada.[17] John Stevenson and Andrew Clement performed a comparative policy analysis between Japan, the European Union, the US, and Canada.[18]

While the majority of scholars appear either neutral or in favor of network neutrality, the literature includes some scholarly detractors. Most notably, this group includes legal scholar Christopher Yoo who has argued against the issue on the basis of its technical infeasibility, industrial pressure and unnecessary intervention.[19] Adam Thierer has argued the neutrality debate may be an example of regulatory overreach, which threatens the innovation of networks.[20] Other arguments against network neutrality policies or interventions include a comparison to broadcast licenses by Richard Epstein and an overview of regulatory trends in comparison to neutrality by Weisman and Robinson.[21] Some, like Robert Zelnick and Eva Zelnick have suggested temporary network neutrality policies may endanger the long-term feasibility of the internet itself.[22]

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[17] Cave and Crocioni, "Does Europe Need Network Neutrality Rules?"; Crocioni, "Net Neutrality in Europe"; Blevins and Shade, "Editorial."
[18] Stevenson and Clement, "Regulatory Lessons for Internet Traffic Management from Japan, the European Union, and the United States."
[19] Yoo, "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management"; Yoo, "Is There a Role for Common Carriage in an Internet-Based World?"; Wu and Yoo, "Keeping the Internet Neutral?"; Yoo, "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management."
[20] Thierer, "'Net Neutrality' Digital Discrimination or Regulatory Gamesmanship in Cyberspace?"; Thierer, "Are Dumb Pipe Mandates Smart Public Policy - Vertical Integration, Net Neutrality, and the Network Layers Model."
[21] Epstein, "What Broadcast Licenses Tell Us about Net Neutrality: Cosmopolitan Broadcasting Corporation v. FCC"; Weisman and Robinson, "Lessons for Modern Regulators from Hippocrates, Schumpeter and Kahn."
[22] Zelnick, *The Illusion of Net Neutrality*.

The ongoing dispute over neutrality has drawn attention from scholars who have analyzed the debate itself – these include studies by Kai Zhu and by Douglas Hass.[23] Likewise, there have been a handful of studies examining the terminology and rhetorical appeals used by both academics and policymakers regarding the issue. These include projects such as a 2013 analysis of congressional records regarding the issue by Gilroy and a 2013 discourse analysis of the term "net neutrality" by Kimball.[24]

While these contributions and many others offer significant contributions to the NN debate, the issue remains unresolved and is often influenced on a number of fronts including politically, economically and by the larger public. While all of these groups have participated in the conversation regarding content discrimination, the size and influence of the participants with a stake in the outcome is particularly significant.

1.1.2 Lines drawn in the neutrality debate

Major participants in the NN debate include some of the world's largest media conglomerates including Comcast, AT&T, and Verizon as well as technology giants like Google, Amazon, Facebook, and Microsoft. The issue has garnered political attention ranging from the US White House to the leadership of the European Union.[25] In particular, neutrality advocates have focused on the threat of network management as a tool for corporate or political censorship.[26] Despite the sometimes-opaque nature of the debate's technical and legal jargon,

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[23] Zhu, "Bringing Neutrality to Network Neutrality"; Hass, "The Never-Was-Neutral Net and Why Informed End Users Can End the Net Neutrality Debates."
[24] Gilroy, "Access to Broadband Networks"; Kimball, "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality.'"
[25] Marsden, *Net Neutrality*; Crocioni, "Net Neutrality in Europe"; Peha, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*.
[26] Brown and Marsden, *Regulating Code*, 141.

the NN discussion has grown to include civil society groups, technological leaders and increasingly the larger public.[27]

NN not only concerns the practical and financial impact of data and bandwidth discrimination to users, content and service providers – but, as Christopher Kelty argues, the rules for how content travels online shape the internet's ethical and technical dimensions.[28] Advocates argue that the benefits of neutrality as a tool for promoting application innovation,[29] weakening monopoly power,[30] protecting free speech and promoting creative content,[31] are worth the potential cost to network providers.

While the term NN is relatively new, it follows a legacy of underlying principles supporting fair and open access to communication networks as well as content-neutral delivery of information with a history extending as far back as the 17th century.[32] Beyond the principles of open and equal access to the global internet, the distinctions between communication, information, infrastructure, and entertainment continue to blur. Networked computing increasingly dominates the spaces of information interaction, creation and exchange throughout the world. Rapid changes in computing and global networking have rested on the growth of fast, uninterrupted, and ubiquitous access to other users, groups and information. But the rhetoric of a democratic and equal web should not be accepted as a given. Sophisticated networking servers and smart networks can now read data as it moves across the web; this

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[27] American Civil Liberties Union, "What Is Net Neutrality?"; Cerf, "'Father of the Internet'"; Berners-Lee, "Net Neutrality: This Is Serious"; Nagesh, "Internet Users Mobilize as FCC Prepares Net Neutrality Plan."
[28] Kelty, *Two Bits*.
[29] Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*.
[30] Crawford, *Captive Audience*.
[31] Lee and Wu, "Subsidizing Creativity through Network Design."
[32] Marsden, *Net Neutrality*.

increases the threat of monitoring and speed management by network owners, often without the users' knowledge.[33]

ISPs argue that to handle the rapidly growing number of users with higher bandwidth demands, they should have some latitude to manage the volume and types of information travelling across their networks.[34] NN opponents argue that overt neutrality intervenes in the market negotiations between content and network providers and potentially violates the property rights of the owners and maintainers of broadband networks.[35] They suggest neutrality policies preventing the management of content and fee structures may discourage network infrastructure improvements and potentially stifling innovation.[36]

Due to their control over much of the internet's physical infrastructure, network owners are in a particularly powerful position to exploit or exacerbate bandwidth limitations and network capacity to their advantage.[37] Wu, however, argues that the intentions of ISPs may extend beyond network management for service improvement and toward reinforcing their powerful and indispensible role in the information economy.[38] He notes: "…it doesn't take a genius to realize that if AT&T and the cable companies exercised broad discretion to speed up the business of some firms and slow down that of others, they would gain the power of life and death over the Internet."[39]

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[33] Brown and Marsden, *Regulating Code*.
[34] Yoo, "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management."
[35] Thierer, "'Net Neutrality' Digital Discrimination or Regulatory Gamesmanship in Cyberspace?".
[36] Ibid.; Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 331–331.
[37] Wu, "Network Neutrality, Broadband Discrimination," 558.
[38] Wu, *The Master Switch: The Rise and Fall of Information Empires*, 551.
[39] Ibid.

1.1.3 A pressing debate

When the term "network neutrality" was coined in 2003, the capacity for networked data transmission and the accessibility to digitally distributed content was far different from today.[40] Broadband connections (offering download speeds of at least 4 Mbps and upload speeds of at least 1 Mbps) have become more prevalent as consumer access to DSL, cable and fiber-optic connections have replaced dial-up connections.[41] In 2003, 16 percent of U.S. adults had a broadband connection at home, a number that would grow to 70 percent only 10 years later.[42] ISPs have benefited from the increased demand for fast connections and have maintained high profit margins – reportedly about 95 to 97 percent - compared to more expensive services like cable television which show profits of around 60 percent.[43] In 2013, roughly a quarter of Comcast's $40 billion in revenue from cable connection services came from its high-speed internet.[44]

In the past 30 years, ISPs like Comcast and Verizon have grown tremendously, while competition for broadband internet access in the US has shrunk.[45] In fact, a 2013 FCC report indicated nearly one-third of U.S. residents have access to only one residential broadband provider and an additional 37 percent have access to only two ISPs.[46] There has also been a marked shift toward cable ISPs like Comcast and Time Warner Cable which offer faster use

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[40] Wu, "Network Neutrality, Broadband Discrimination."
[41] Federal Communications Commission, *Eighth Broadband Progress Report*, 19–20; The FCC may soon consider increasing these speed definitions. See Fung, "The FCC May Consider a Stricter Definition of Broadband in the Netflix Age."
[42] Zickuhr and Smith, *Home Broadband 2013*.
[43] Crawford, *Captive Audience*; Talbot, "Comcast, Verizon Wireless, and Time Warner Cable. When Will the Rest of Us Get Google's Gigabit-per-Second Service?".
[44] Comast Corporation, *Comcast 2013 Annual Report*.
[45] Crawford, *Captive Audience*.
[46] Federal Communications Commission, "Internet Access Services: Status as of December 31, 2012."

speeds than telephone network based services liked DSL.[47] While commercial and residential fiber-optic networking service providers (also known as fiber to the premises or FTTP) like Verizon FiOS and ATT U-Verse – which offer connections many times faster than cable or DSL broadband -- are beginning to emerge and may ultimately shift these dynamics, the majority of US internet users rely on a small handful of networks and service providers.[48]

Likewise, online Content Service Providers (CSPs) have also grown both in size and influence. News, social network, video sharing, and entertainment websites show immense popularity; the most popular networks and sites such as Google and Facebook sport billions of users and have market valuations of billions of U.S. dollars.[49] For example, Google's massive reach extends from online advertising (it's primary form of revenue) to search, email (Gmail), document scanning (Google Books) and many more projects. Siva Viadyanathan argues Google's search prioritization and sheer scale of services is increasingly making the company "the lens through which we view the world."[50] That "lens" relies on fast, reliable internet access. The growth of CSPs has coincided with a shift in the nature of online use marked by the increased popularity of "application" or self-contained and maintained online spaces rather than a network of individually created and maintained websites.[51]

The increased popularity of online video services has led to a growth in the volume of information travelling across networks. Video services such as YouTube, online streaming subscription services like Netflix and the growth of peer-to-peer file-sharing services make up

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[47] Crawford, *Captive Audience*.
[48] Ibid.
[49] Dijck, *The Culture of Connectivity*.
[50] Vaidhyanathan, *The Googlization of Everything*, 7.
[51] Anderson and Wolff, "The Web Is Dead. Long Live the Internet."

an increasingly large portion of U.S. internet traffic.[52] Services like Netflix, which boasted over 44 million subscribers in 2014, are increasingly competing with cable television for viewers.[53] According to a 2014 report by internet traffic monitor Sadnvine, Netflix was responsible for the overwhelming majority of downstream internet traffic in the US, with the service consuming 34 percent of the bandwidth used during peak hours.[54] Google-owned video streaming site YouTube consumed over 20 percent of the bandwidth in Europe, Asia-Pacific and Latin America.[55] In the US, the top 15 percent of users were responsible for over half of all internet traffic and consumed 11-times more streaming content than the average internet subscriber.[56] ISPs (many of which are also cable television providers) claim the growth of these bandwidth-heavy services and users requires greater latitude of controls to guarantee consistent service. Some critics, like Crawford, argue this control may be used as an excuse to exert pressure on video service competitors siphoning "cord cutters" from traditional cable TV service.[57]

To complicate matters further, the lines between ISPs and CSPs are eroding. In part, the NN debate is the result of the convergence of television, data, and telephone services within a single network.[58] With previously separate forms of media increasingly traveling across the internet infrastructure, network providers are investing in online content (e.g. Comcast's acquisition of NBCUniversal) while some content providers have started investing in broadband construction (e.g. Google's fiber-to-the-home initiatives). Service agreements

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[52] Fung, "Verizon Denies Using Net Neutrality Victory to Sabotage Netflix, Amazon"; Lobato, *Shadow Economies of Cinema*; Dijck, *The Culture of Connectivity*.
[53] Kafka, "Netflix Is Chasing HBO, but It's Already Passed Plenty of Big Cable Guys."
[54] Sandvine, *Global Internet Phenomena Report 1H 2014*, 6.
[55] Ibid., 12, 18, 25.
[56] Ibid., 7.
[57] Crawford, "Why Net Neutrality Matters to You - Susan Crawford"; Crawford, *Captive Audience*.
[58] Crowcroft, "Net Neutrality."

between content and networks, vertical ownership agreements, and paid access to networks further complicate their interactions.[59]

These relationships are further complicated by the introduction of customer-facing network providers connect to high-capacity backbone network providers (such as Level 3) that link ISPs to each other. The agreements between backbone providers have generally received far less regulatory scrutiny than those of consumer-facing ISPs.[60] According to Lee and Wu, these agreements between backbone providers, ISPs and the largest CSPs (often called access fees or usage fees) are markedly different from fees charged to consumers.[61]

The rapidly shifting conditions surrounding NN have made the issue both more pressing, but also more complex. The technological, economic and political specifics of the last 10 years have changed greatly; the dramatically expanded role of digitally networked communication has facilitated a corresponding increase in the power of network operators and the concerns of internet users about that power.

1.2 A multi-dimensional approach

Network Neutrality has been described as "a subject that sounds mind-numbingly dull," but this may only be a sign of the density and scope of the subject matter.[62] The concept lies at the center of many ongoing conversations and trends of technology, politics, society and economics. Because of this complexity, a critical, historically grounded, and systematic examination of the ongoing NN debate is warranted to better understand the nuances and development of the neutrality, its major institutional actors, and its place in the larger development of the current media / information environment.

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[59] Ibid., 53.
[60] Hahn and Wallsten, "The Economics of Net Neutrality."
[61] Lee and Wu, "Subsidizing Creativity through Network Design," 62.
[62] Bilton, "Disruptions."

1.2.1 Neutrality, information and power

The challenges and opportunities of NN echo those described in earlier media scholarship by raising questions about the impact of information technology on political, social, and economic life.[63] Political economy scholars have paid particular attention to the ways institutional structures of ownership, development, and technological shifts have significantly affected the expansion, content and larger reception of media throughout the world.[64] The political economy approach recognizes the importance of examining and analyzing institutional and economic power imbalances in society and their possible effects.[65] Today, the growing importance of global, digital information and communication networks has magnified these power imbalances. Robert McChesney and Dan Schiller warn that consolidation of the most influential media organizations only increases the potential for censorship, exploitation, inequality and silencing.[66] The political economy approach encourages critically examining these economically powerful institutions and actors, while highlighting the social and political implications of their actions.

Historically, media technologies and networks (as well as their controllers) have acted as primary conduits of political, economic and cultural development and power.[67] The work of Frankfurt School scholars like Theodor Adorno and Max Horkheimer and their concerns about

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[63] Innis, *Empire and Communications*.
[64] Mosco, *The Political Economy of Communication*; McChesney and Schiller, *The Political Economy of International Communications: Foundations for the Emerging Global Debate about Media Ownership and Regulation*; Winseck and Pike, "Communication and Empire Media Markets, Power and Globalization, 1860—1910."
[65] Kuruma, *History of Political Economy*.
[66] McChesney and Schiller, *The Political Economy of International Communications: Foundations for the Emerging Global Debate about Media Ownership and Regulation*.
[67] Castells, *Communication Power*; Anderson, *Imagined Communities Reflections on the Origin and Spread of Nationalism*; Innis, *Empire and Communications*.

the political and social effects of media ownership has driven critical media scholarship.[68] Rapid growth and centralization of media ownership and distribution in the last half of the 20th century has inspired political economists and other communication scholars to examine the powerful potential and effects of changing media ecologies not only in the U.S. but throughout the world. Likewise, studies examining media industries extends the legacy of early media scholars while combining the political economy and cultural studies legacies of communication research to better understand the nexus of politics, economics, media, and information.[69]

The role of media institutions, powerful communication actors and media policy extends beyond ownership to the nature of information and the role of it in social and political life. As Armand Mattelart notes: information's role in society has changed greatly since the Enlightenment and its collection, ownership and distribution have played a role in the acceleration of military expansion, imperialism and global capitalism.[70] The expansion of digital information across the internet is only the most recent example of this trend.

Dan Schiller argues information has increasingly become a commodity that is packaged, sold and distributed as a major aspect of the current U.S. economy.[71] His work traces the legacy of intellectual property laws, communication systems and policies in protecting the economic potential of information and privileging the powerful corporations and institutions best positioned in the global information and media environment.[72] With its origins as a decentralized communication network for the U.S. military, the global internet increasingly

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[68] Adorno and Horkheimer, "The Culture Industry: Enlightenment as Mass Deception."
[69] Kellner, "Media Industries, Political Economy, and Media/Cultural Studies: An Articulation."
[70] Mattelart, *The Information Society*.
[71] Schiller, *How to Think about Information*.
[72] Ibid.

drives economic and political power and because of that, the corporations and organizations that control how information moves across the internet wield immense influence.[73]

Digitization and global connection has made communication networks (and the transportation of information across them) increasingly significant to everyday life and commerce. As media ownership continues to concentrate through both vertical and horizontal integration and the arbiters of content distribution and creation increasingly merge to become a handful of competitors – the means and motivation to exert influence on the traffic of information increases. This, combined with *laissez-faire* regulation and rapid technological change, means that it is vital for critical media scholars to focus on issues like infrastructure, industrial influence and ownership.

1.2.2 Four modalities of regulation

In addition to a critical, political economic perspective which scrutinizes the historical and relational shifts of the involved media institutions, this examination of the NN debate warrants a theoretical framework that systematically breaks the primary terms and issues of the debate into significant, but manageable categories while recognizing the interconnection of each category to each other and the issue as a whole.

[73] Mattelart, *The Information Society*, 139; Morozov, "Freedom.gov."

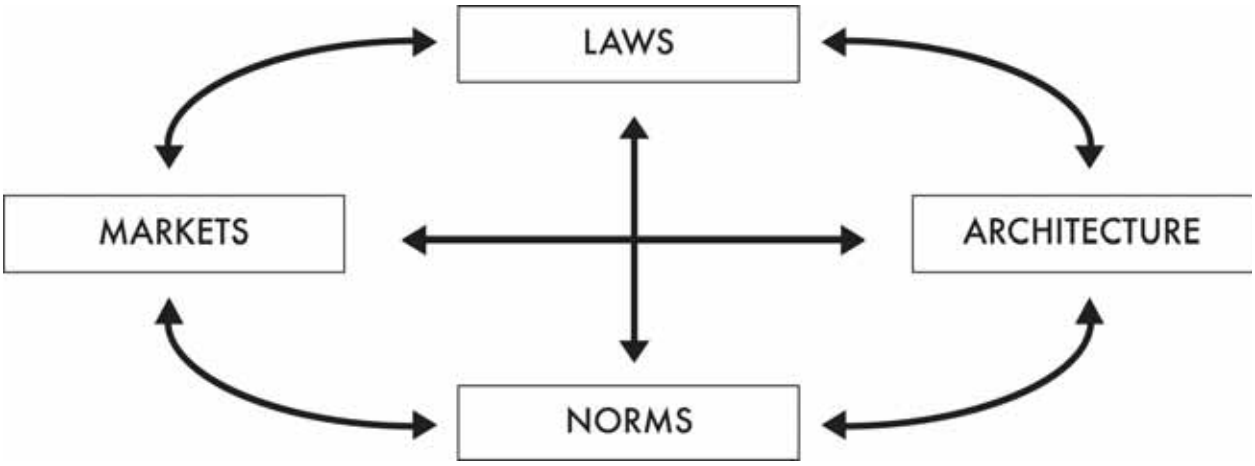

Figure 1.0.1 Lessig's four modalities.

Lessig's four modalities, a theoretical design first described in his essay "The New Chicago School," offers a pattern for understanding the multiple dimensions which regulate behavior.[74] He describes four separate, but cooperating concepts (see Figure 1.) – laws, markets, architecture, and norms – which together describe and dictate the tools society has for regulating behavior. These four modalities shape the social understanding of issues and their role in society.[75] Whereas policy studies may be constrained to the law and its effects, a study of multiple modalities offers a more encompassing perspective that includes factors like commerce, structure and culture.

Lessig emphasizes that each modality works with and against the others to form a wider regulatory environment not limited to any particular aspect.[76] The regulations and their secondary effects on each other shape behavior for both users and the tools themselves. In the context of online activities, Lessig offers a few examples to illustrate each of the modalities.[77] For example:

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[74] Lessig, "The New Chicago School."
[75] Ibid.
[76] Lessig, "The Law of the Horse," 532.
[77] Ibid., 508–509.

Laws: Many if not all states have laws and policies regarding obscenity, copyright, state secrets and speech that continue online different levels of enforceability online. [78]

Norms: Community-accepted social conventions about behavior on message boards or comments sections of websites often have standards and customs of behavior.

Markets: Price structures, advertising agreement, paid access, ownership and sponsorship, may affect what people see and do online or their ability to contribute to ongoing events or conversations.

Architecture: The TCP / IP and other protocols of web have been and continue to be designed to facilitate particular forms of interaction and activities. The programmed architecture of the web enables (or prohibits) various degrees of security, anonymity, accountability, tractability and information capacity.[79] Because online architecture is particularly subject to the whims of its creators and owners, some aspects of the web's architecture may afford greater information spread;[80] other parts have been designed to create choke points which allowing sophisticated information filtering and censorship.[81]

In particular, architectural choices, called "codes" by Lessig, are often the result of individual decisions that establish the parameters of online activities (which may or may not align with the larger public's will.)[82] He suggests, "the most effective way to regulate behavior in cyberspace will be through the regulation of code - direct regulation either of the code of cyberspace itself, or of the institutions (code writers) that produce that code."[83] However, this

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[78] In particular, see the conflict between Yahoo! and France in Goldsmith and Wu, *Who Controls the Internet?*.
[79] For many more examples, see Lessig, *Code*.
[80] Leigh and Harding, *Wikileaks*.
[81] MacKinnon, *Consent of the Networked*; Yang, *The Power of the Internet in China*.
[82] Lessig, *Code*, 24.
[83] Lessig, "The Law of the Horse," 514.

may be easier said than done. Individual instances may be easy for laws to regulate, but larger, shifting social trends are much more difficult.[84]

Rather than serving as definitive categories, Lessig's modalities are not meant to be exhaustive, but rather a starting point for examining the different vectors that shape human behavior. Recently, other scholars have employed similar arrays of categorizations or modalities to understand media and technologies are created, consumed or understood. For example, Price emphasizes the balancing relationships between sovereignty, technology, and cultural norms in his examination of global media power.[85] Gillespie examined how platforms interact with cultural, regulatory and market demands in his examination of the video site YouTube.[86] Van Dijck explored the interplay between ownership, technology, governance, usage, content and business models in a variety of online platforms while examining the interplay between ownership, technology, governance, usage, content, and business models.[87] Yang's *The Power of the Internet* employs a slightly different modality-based scheme for examining online activism in China.[88] While these adaptations sometime differ from Lessig's specific modalities in terminology and focus, they share an emphasis on examining these media issues across multiple, interacting dimensions.

Neutrality's ramifications extend beyond policy ~~and~~ to an underlying understanding of how users and stakeholders agree the functionality and operation of network protocols may operate and how information may be distributed. The expansive and evolving nature of the NN issue requires a systematic categorization of the elements operating within the debate. As Lessig

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[84] Ibid., 534.
[85] Price, *Media and Sovereignty*.
[86] Gillespie, *The Politics of "Platforms."*
[87] Dijck, *The Culture of Connectivity*.
[88] Yang, *The Power of the Internet in China*.

notes, "to understand how a regulation might succeed, we must view these four modalities as acting on the same field, and understand how they interact."[89]

1.3 Unpacking neutrality regulation

Network neutrality's implementation and enforcement in the United States been marked by a handful of piecemeal policies and regulations that have been repeatedly struck-down in court. Because of this, the handful of policy orders issued by the FCC over the last two decades has largely relied on market, architectural and normative conditions of telecommunications and internet technology providers to enforce non-discriminatory information movement. Lessig's four modalities (laws, norms, markets, and architecture) offer a way to outline a fuller landscape of regulation, and in the case of NN this is particularly true.[90]

Unlike previous information communication technologies (like telephones and railways), the decentralized nature and protocols of the internet combined with its underlying infrastructure has served as both a justification for and against neutrality policies. Likewise, the normative understanding of the internet and its relationship to openness and independence beyond the physical and technological has fueled and sometimes divided the popular understanding of the global networks' capabilities and the role of users within it. Powerful market actors and gatekeepers have an immense influence on users and content.[91] The following project unpacks these issues by offering comparative study that unpacks multiple aspects of the neutrality debate both in the US and abroad.

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[89] Fung, "Verizon Denies Using Net Neutrality Victory to Sabotage Netflix, Amazon."
[90] Lessig, "The New Chicago School."
[91] Herrman, "Welcome To The Net Neutrality Nightmare Scenario."

1.3.1 Knowledge through comparison

As Castells notes, "the United States represents the exception in the history of communication regulation from a global perspective."[92] Net neutrality is no exception. Unique historical, political, demographic and economic considerations have led to a wide range of approaches and perspectives regarding NN.[93] For example, some highly developed and commercially oriented countries share similar elements to the US and it's approach to network structure, ownership and policies.[94] These similarities and differences have been further affected by the introduction and growth of international organizations such as the International Telecommunications Union (ITU) and global / regional trade agreements like the General Agreement on Tariffs and Trade or GATT, the World Trade Organization (WTO.)[95] Different perspectives from throughout the world offer insights into potential solutions, principles and challenges in maintaining, establishing or constructing practical and effective non-discrimination policies.

1.3.2 Research questions

This is a project of diagnosis, comparison and analysis. In it, I examine the failure of architecture, norms, and markets to maintain network neutrality and prevent information discrimination across the Internet in the US. To do this, I examine the concepts and history of these elements regarding networked communication as well as compare and contrasting their failures (and successes) in other countries throughout the world.

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[92] Castells, *Communication Power*, 109.
[93] Ma and Misra, "The Public Option"; Crocioni, "Net Neutrality in Europe"; Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks."
[94] Marsden, *Net Neutrality*.
[95] Cowhey, Aronson, and Abelson, *Transforming Global Information and Communication Markets the Political Economy of Innovation*, 153–155.

With this project I seek to answer the following research questions:

RQ1: How have laws, norms, architecture, and markets each contributed to the current NN regulatory framework in the US?

RQ2: How can the policy responses to market, architecture, and normative regulation of NN in select international case studies inform future network neutrality policy in the US?

1.3.3 Method

Through a series of comparative case studies highlighting both US and non-US approaches to the issue, this project examines the failure of norms, markets, and architecture to maintain effective NN policy. As Ran Wei notes, case studies offer a useful tool for researching new technologies, particularly because the approach allows researchers to examine specific technologies or element of those technologies that are rapidly changing.[96] Case studies also provide a significant way to examine and unpack complex situations, behaviors or processes.[97] In particular, John Odell notes that comparative case studies provide a powerful methodology for examining international political economy issues.[98]

While each of the above modalities has drawn the attention of many different groups, participants and institutions have played a part in the perception, policymaking and regulation of this issue. This process includes tracing and analyzing significant elements of each modality within the US context and in the context of each chapter's selected case studies outlined below. These kinds of disciplined, interpretative case studies, particularly when conducted using comparative examples, provide deeper context and more nuanced examinations of issues, while also offering a tool for critically examining and contextualizing theoretical arguments.[99]

But studying how modalities have regulated NN in the US context alone may not be as informative as examining them in comparison to other areas around the world. Comparing

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[96] Wei, "New Media Research," 393.
[97] Tuten, "Field Observations and Case Studies," 268–269.
[98] Odell, "Case Study Methods in International Political Economy."
[99] Odell, "Case Study Methods in International Political Economy," 163.

multiple cases studies gives an opportunity to both examine the conditions affecting each while also highlighting their relevance in a broader context.[100] Arend Lijphart notes that comparative studies should be resorted to when the number of cases are too small for an adequate control to be found, however in cases of comparing state approaches, their status as a unified political body offers some baseline for comparison[101] Because of this project's focus on the regulation of a global issue by national policy decisions, the following project compares only select case studies of where regulatory, cultural, geographic, and economic conditions are relatively comparable.

Starke argues the combination of qualitative analysis within comparative case study projects offers researchers a useful method for tracing changes in decisions and beliefs, particularly in the case of policies.[102] Thus, case studies examining the regulatory effects of these modalities with selected non-US approaches offers a tool for answering the above research questions by contrasting the potential effects of differing conditions and policies on the regulation of NN. These documents include, statements, testimony and financial reporting from corporate ISP and CSP participants in the debate, as well as similar documents from civil society organizations including legal and academic experts, governments, international governance organizations, non-governmental organizations. Examining US and non-US approaches to these elements in relation to each other brings into relief the failures or successes of each modality to preserve NN in the US. Likewise, they also reveal the benefits or consequences of alternate policy opportunities and trends which may guide the US's approach to the debate moving forward. For that reason, this use of comparative case studies offers a particularly useful

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[100] Yin, *Case Study Research*, 45–49.
[101] Lijphart, "Comparative Politics and the Comparative Method," 648, 690.
[102] Starke, "Qualitative Methods for the Study of Policy Diffusion," 577.

method for contextualizing and unpacking the claims made by Yoo, Theierer and Epstein that non-policy alternatives are a viable alternative to more explicit network neutrality rules.[103]

1.3.4 Significance

NN is a vast and complex subject that demands continued examination and analysis. This project contributes to that body of work by offering a multi-dimensional, systematic approach to the topic and features comparative analyses between the US approach and other select international case studies. While Lessig has played a significant role in the NN debate and has used the modalities approach to look at cyber-regulation, to my knowledge the approach has not been used for an in-depth examination of network neutrality.[104] This thesis shows the utility of this approach while also seeking to categorize and clarify previously complex aspects of neutrality regulation.

The combination of multi-dimensional analysis using Lessig's modalities, along with comparative case studies demonstrate how network neutrality issues are addressed (or not addressed) in the US and abroad. As neutrality policy is being negotiated both in popular press, academic institutions and political halls – a series of comparative case studies like this offers a way to understand the issue's history and conditions using multiple examples and situations.

The combination of these two approaches offers insight into NN conditions and policy approaches that affect neutrality's success or failure. In particular, it demonstrates the failures of markets, architecture, or norms to exclusively preserve content non-discrimination online and shows the need for strong policy measures to maintain certain principles of network communication.

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[103] Yoo, "Is There a Role for Common Carriage in an Internet-Based World?"; Thierer, "'Net Neutrality' Digital Discrimination or Regulatory Gamesmanship in Cyberspace?"; Epstein, "What Broadcast Licenses Tell Us about Net Neutrality: Cosmopolitan Broadcasting Corporation v. FCC"; Yoo, "Network Neutrality and the Economics of Congestion."
[104] Lessig, *Code*; Lessig, "The New Chicago School"; Lessig, "The Law of the Horse."

1.4 Chapter outline

This project dedicates a chapter to each of the four modalities listed above as well as a conclusion in which I outline several policy proposals based upon the findings of this comparative analysis.

In chapter two, I outline the current state of network neutrality as it has been acknowledged, supported or dismantled through US law and policy – primarily focusing on the actions of the FCC, which in lieu of more direct legislation has played the most significant role in interpreting, shaping and maintaining NN in the US. This chapter offers an overview of the network neutrality conditions facing the US today as well as the policy approaches and their effects. Specifically, it demonstrates the pattern of neutrality policy development from its origins in the policies governing legacy technologies to an ongoing balance between deregulation and the FCC's nominal attempts to preserve the principles of content non-discrimination and the Open Internet in the face of increasingly constraining court rulings.

Chapter three examines the architecture of the internet and the contested nature of its structure on both infrastructural and protocol levels. Lessig emphasizes the role of code (the actual programmed and adaptable nature of digital spaces) as well as the actual infrastructure in dictating use, particularly online.[105] This chapter highlights the competing protocols whose evolution has shaped the potential for network management. It also focuses on the infrastructure elements and how their relationship to each other affects the potential for neutrality. To highlight this, I compare the US infrastructure to new nationally designed and constructed infrastructures in Australia and New Zealand and the extent to which these designs both preserve and potentially endanger neutrality. Likewise, it examines how architecture has

[105] Lessig, "The Law of the Horse"; Lessig, "In Support of Network Neutrality."

been used not only to preserve network neutrality, but examples where architecture actively intervenes and discriminates in the movement of online content.

Chapter four explores how markets and economics have driven much of the regulatory discussions regarding network discrimination and neutrality.[106] The vertical integration of network and content providers is the result of increasing deregulation and *laissez-faire* policies toward media organizations over the last 30 years.[107] This concentration of the most powerful network actors in concert with legal protectionism toward legacy media institutions compared to emerging ones has only emphasized the massive market stakes of the network neutrality debate. This chapter examines the commercial market evolution of internet access and competition in the US and its failure to preserve neutrality. I examine how European Union policymakers have designed and pursued policies designed to encourage market competition through unbundling and industry-wide, principle-based strategies for encouraging neutrality through competition. This chapter highlights the potential benefits and limitations of market-based regulation in generating neutrality.

Chapter five shows the significance of normative views affecting the development and continuance of network neutrality. It emphasizes the legacy of common carrier principles which have set a historical standard for the expectations of communication networks, the perspective of the web as a commons of equal distribution and participation has significantly affected the expectations and descriptions of globally networked computer technology. This chapter emphasizes the role leading public figures and civil society groups have played in the portrayal of network neutrality and it's representations in regards to the "open internet" in the US. This case study highlights the role international internet governance groups such as the ITU have

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[106] Brown and Marsden, *Regulating Code*; Hahn and Wallsten, "The Economics of Net Neutrality"; Atkinson, "Economic Doctrines and Network Policy."
[107] Holt, *Empires of Entertainment,* 13.

played or interfered in setting international normative standards for how nations should address the issue of network neutrality. These international standards both reflect the US's position and sometimes affect US policy approaches to the issue.

In the conclusion chapter, I outline some of the most significant network neutrality policy proposals highlighted by the preceding comparative case studies. These proposals range from the easily implemented to more complex institutional and structural changes that may create more equitable content distribution across the internet. The differences and similarities highlighted by the previous chapters case studies offer a range of options available for US policy moving forward. By examining the failure of existing non-policy options for protecting and promoting network neutrality, I emphasize a handful of common principles contributing to ongoing network neutrality discussions.

2 US NETWORK NEUTRALITY POLICY: AN OVERVIEW

This chapter provides a brief history of policy decisions affecting today's network neutrality debate. Specifically, it offers an overview of the major policy events and shifts leading to an over-reliance on the other three modalities to preserve content non-discrimination online. The amount of interest these principles have received is often the result of specific historical trends in technology, markets, and norms and this often reflects those influences.

2.1 Chasing changing technologies

Information policy has played a significant role in the rule of powerful states and actors throughout recorded history.[108] Our modern conception of media policy is far more recent, particularly in regards to the technologies used to transmit information.[109] In some ways, the Internet is unlike any previous information communication technology. While it relies on the same interconnection and interoperability of networks like telephone or electricity, its operations are far more decentralized and its protocols are generally open and free to new users.[110] Because of this, a wide range of authorities, organizations with many different powers and interests have participated in setting and maintaining internet policy.

In the political economy tradition, historical analysis plays an important role in unpacking the movement of power and social change. Mosco notes that the study of

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[108] Innis, *Empire and Communications*; Braman, *Change of State*.
[109] Braman, *Change of State*, 4–5.
[110] Brousseau, Marzouki, and Méadel, "Introduction - Governance, Networks and Digital Technologies: Societal, Political and Organizational Innovations"; Cowhey, Aronson, and Abelson, *Transforming Global Information and Communication Markets the Political Economy of Innovation*.

history is one of the central tenants of the approach and that "one simply cannot do good political economy without history."[111] These analyses recognize the ongoing project of change and the influence social, economic, political and technological forces play in both the history of events and how those events are represented.[112] With that as a guide, this chapter offers a historical revue of policy and legal choices affecting network neutrality while avoiding falling into the trap of determinism.

In this context, it's important to note the role of policy in this discussion. In his outline of the four-modality approach, Lawrence Lessig summarizes that in its most basic form, law is a form of regulation that threatens sanctions if disobeyed.[113] Communication scholar Sandra Braman notes that law and policy are slightly different aspects of governance: law offers an explicit rule, policy is a formal or semi-formal established principle.[114] As this chapter shows, the distinctions between these elements may be significant in specific contexts (see the section on Comcast Corp. v FCC). It should be noted, that the implications of law and policy as direct representations of the public's will are complex and disputed.[115] However, Lessig notes that examining the regulatory effects of law and policy are more useful lenses for studying technology and media regulation, than focusing on the legitimacy of those laws.[116]

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111 Mosco, *The Political Economy of Communication*, 110.
112 Ibid., 110–111.
113 Lessig, "The New Chicago School," 622.
114 Braman, *Change of State*, 3.
115 Coleman, *Markets, Morals, and the Law*, 3–25; Price, *Media and Sovereignty*, 58–65.
116 Lessig, *Code*, 5.

2.1.1 A powerful place at the table

Today, the networks through which information travels have often played a particularly influential role in enacting or avoiding policy actions. Because these network owners are often also the owners of legacy networks (mostly telephone and cable), they often occupy a powerful position for shaping these new technological developments and policy.[117] It should be no surprise that they have used this power to their advantage and to protect their existing media holdings.[118] Not only that, but these few actors hold particularly powerful positions of influence with the political structure responsible for maintaining and establishing media policy favorable to entrenched interests.[119] Holt describes the conundrum:

> Converging entertainment, information, and communication industries are being regulated by policies designed for a different era. Meanwhile, the technologies, markets, and regulatory principles for these industries are no longer distinct enough to accommodate separate paradigms.[120]

In recent decades, rapid technological changes have been to justify deregulation and media concentration in the name of public interest.[121] Network neutrality lies at the heart of the current conflict about the role of the internet: Is it part of the commons or is it a collection of privately operated spaces?[122] For Mueller, the debate "signals a major renegotiation of the relationship between what is private, differentiated and managed and what is uniform and common on the internet."[123]

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[117] Wu, *The Master Switch: The Rise and Fall of Information Empires*.
[118] Castells, *Communication Power,* 99.
[119] Ibid., 106–107.
[120] Holt, *Empires of Entertainment,* 176.
[121] Ibid., 177.
[122] Mueller, "Property and Commons in Internet Governance," 40.
[123] Ibid., 51.

2.2 Policy for the public

Since early in the 20th century, media policy has sought to find a balance between public and private interests.[124] The Federal Radio Commission (FRC), which later was renamed in 1934 as the FCC was first created to serve just this purpose – bringing order to the onslaught of commercial radio broadcasters overlapping each other across the airwaves that were considered in the public's jurisdiction.[125] The commission also took a strong role in the governance of telephone networking (dominated by the AT&T monopoly) as interconnection and long distance communication became an increasingly valuable activity.[126]

Common carriage, a term now more often associated with regulating infrastructure and monopolies, has a long legacy leading to today's network neutrality debate. In his work, Beyond Liberalization II, Eli Noam argues the term, first associated with service in the public interest, extends as far back as the Roman Empire:

> For centuries, common carriage principles have played an important role in the infrastructure services of transportation and communications. They intended to guarantee that no customer seeking service upon reasonable demand, willing and able to pay the established price, however set, would be denied lawful use of the service or would otherwise be discriminated against.[127]

Common Carriage rules were used to help decide liability in cases of robbery, attack or destruction.[128] Generally, common carriage rules were instituted to protect the

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[124] de Sola Pool, "The Rise of Communications Policy Research."
[125] Coase, "The Federal Communications Commission"; Hilmes, *Hollywood and Broadcasting*.
[126] Wu, *The Master Switch: The Rise and Fall of Information Empires*.
[127] Noam, "Beyond Liberalization II."
[128] Jones, "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective."

public interest from abuse with an expectation of service, particularly in regards to transportation services like railroads and transportation.[129] Beginning in the mid-1800s, municipalities and states began offering franchises to telegraph companies with the understanding that this would provide safer conditions than allowing all comers to construct networks.[130] The legacy of this is seen today as cable and telephone operators continue to sign exclusive franchise agreements with cities and towns.[131] In the 1860s, a series of laws passed by the US congress authorizing the expansion of telegraph networks – with provisions that these networks offer equal access, pricing for use without discrimination. [132] Those same protections were expanded to telephones in 1910. These policies were largely reinforced through the early 20th century, with judges noting the public interest of common carriers and the services they provided.[133] The Communications Act of 1934, which created the FCC also further clarified rules regulating the existing monopolies of AT&T (telephone) and Western Union (telegraph) as common carriers, subject to regulations made in the interest of the public.[134] Through subsequent revisions, the rules of common carriage have survived for telecommunications networks – though some notable exceptions including data services and cable television were carved out as they emerged.[135]

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[129] Crawford, *Captive Audience*, 30.
[130] Jones, "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective."
[131] Koebler, "The FCC Can't Help Cities Trapped By Predatory Internet Deals With Big Telecom | Motherboard."
[132] Jones, "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective."
[133] Ibid.
[134] Ibid.
[135] Crawford, *Captive Audience*, 53–55 Also see previous chapters for more on this.

The basis for the exclusion of internet service from common carrier obligations is in many ways a result of its newness. Because communication policies must be developed as the technologies emerged, rules created for previous technologies often become the rules governing new ones. Legislation and FCC rules based on remote data processing technology of the 1970s and cable television networks of the 1990s became the basis for broadband's exemption from common carriage obligations.[136] The result is a shift from common carrier providers who offered greater protection for public interactions in exchange for private contract carriers with much greater flexibility to grow but also more control over the content traveling across their networks.[137]

Whether for practical or political reasons, the FCC's choice to separate broadband service from the potentially onerous (but also non-discriminatory) obligations of common carriers holds the potential for slowing innovation as well.[138] Years after the 2002 cable internet order which classified broadband as an "information service," ISPs have become increasingly dominant and the web has become an essential part of everyday life and commerce for many.[139]

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[136] Marsden, *Net Neutrality*, 31–34; Crawford, *Captive Audience*, 53–55.
[137] Noam, "Beyond Liberalization II," 448–452; Frieden, "Contamination of the Common Carrier Concept in Telecommunications," 695–696.
[138] Patel, "The Wrong Words"; Federal Communications Commission, "FCC Classifies Cable Modem Service as 'Information Service': Initiates Proceeding to Promote Broadband Deployment and Examine Regulatory Implications of Classification."
[139] Crawford, "Back to the Digital Drawing Board."

2.3 New connections: the internet emerges

Like its predecessors (radio, television and cable television) rules regarding the internet emerged slowly.[140] Originally built as decentralized network to connect research computers, the Advanced Research Projects Agency Network or ARPANET was funded by the research division of the US Department of Defense.[141] First connected in 1969, the network linked a handful of participating research institutions including the Stanford Research Institute (SRI) and the University of Southern California's Information Sciences Institute (ISI) and would ultimately grow to connect dozens of research institutions and government agencies.[142]

The ability to operate these connections across AT&T's telephone network was in part thanks to two landmark regulatory decisions. *Hush-a-Phone Corp. v. United States* and the FCC's 1968 *Carterfone* ruling formed the basis for much of the non-discrimination standards in the US.[143] The *Carterfone* decision ended AT&T's strict control over the attachment of third-party devices to its network. These rulings would pave the way for the use of telephone communication networks for other information transmission.[144] This would ultimately allow users and businesses to connect modems and computers directly to telephone networks and the internet.

By the 1970s, telephone networks were being used not only for the transmission conversations, but also of data. The growth of this technology allowing computers to

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[140] Wu, *The Master Switch: The Rise and Fall of Information Empires*; Castells, *Communication Power*.
[141] Internet Society, "Brief History of the Internet - Internet Timeline."
[142] Goldsmith and Wu, *Who Controls the Internet?*, 33–36.
[143] Burstein and Schneider, "Trustworthiness as a Limitation on Network Neutrality."
[144] Lemley and Lessig, "The End of End-to-End."

transmit over traditional telephone networks led the FCC take a stronger role in arbitrating how these actions should take place. In a series of inquiries, as Bagwell notes, the FCC attempted to distinguish between how that information was to be regulated: in 1966 *Computer I* sought to distinguish telecom technology (which is subject to common carriage regulations) from data processing technology, while the 1979 *Computer II* decision separated basic (information transmitted unchanged) and enhanced information communications.[145] These inquiries established requirements ensuring public access through regulated telecommunications infrastructure, in contrast to broadcasting and cable transmission regulated based on content. The 1985 *Computer III* inquiry proposed unbundled and equal access to basic network services, but the FCC chose to apply these new rules only to wireline services, excluding the growing DSL and cable broadband Internet service.[146] The 1984 breakup of AT&T into eight "baby bells" fragmented the company's network monopoly and further increased the variety of the networks available for all purpose, unrestricted use.[147]

The expansion of the internet was in part funded through the support of research universities and institutions as well as through the financial and logistical support of the National Science Foundation who designed and managed the initial internet backbone known as NSFNET that connected research institutions across the country.[148] The network was proposed as an alternative to the practice of leasing large

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[145] Bagwell, *An Open Internet for All*.
[146] Nunziato, *Virtual Freedom*.
[147] Lemley and Lessig, "The End of End-to-End," 13.
[148] Markoff, "The Team That Put the Net in Orbit."

communication pathways through telephone operators.[149] With congressional support from then-Tennessee Senator and future-Vice President Al Gore in funding for the National Research and Education Network was passed in 1991 and helped fund dramatic expansions for NSFNET that would ultimately be privatized in 1996.[150] The development and expansion of NSFNET helped shape the initial US infrastructure of what would become the commercial internet.

2.4 Commercialization and deregulation

The 1990s and 2000s saw an incredible growth in internet use and popularity. Likewise, the trends of media consolidation, concentration and deregulation that began in the 1980s continued to expand to the emerging internet ecosystem.[151] In 1997, the Clinton administration's "Framework for Global Electronic Commerce," offered a neutrality-like endorsement of an unrestricted internet, but this appeared to be largely focused on supporting the economic expansion of internet services, rather than setting a precedent for protecting content.[152] The Telecommunications Act of 1996 did not expressly include internet and broadband transmissions, but the law sought to encourage expansion of service through non-intervention.[153] Instead it roughly outlined rules based on the types of technologies involved: telecommunications technology operating on telephone wires were classified as Title II and afforded common carriage

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149 Internet Society, "Brief History of the Internet - Internet Timeline."
150 Markoff, "The Team That Put the Net in Orbit."
151 Holt, *Empires of Entertainment*.
152 White House, *A Framework for Global Electronic Commerce*.
153 Bagwell, *An Open Internet for All*.

rules under, coaxial cable services were classified under Title VI and generally considered entertainment, etc.[154] However, the role of internet service was less clear.

Because the internet operated on both telephone and cable networks, there was a need to clarify what rules should apply. If it was considered primarily a telecommunications transmission, the rules of common carriage would be maintained; if considered a cable service, greater control would remain with network operators. In lieu of clear guidelines regarding internet classification, the US Ninth Circuit Court of Appeals ruled common carriage telecommunications rules should apply to internet service.[155] In response, the FCC used its powerful classification powers to outline broadband serve, not as a telecommunication service, but instead as a separate "information" technology.[156] This decision, outlined in the 2002 Cable Internet Order issued by chairman Michael Powell, declared internet services operating on telephone lines as not subject to common carrier protections are one such example. Claiming that minimal regulation would spur innovation for the new medium, the order meant internet traffic would be governed based on its use, rather than the particular infrastructure it traveled.[157]

In the 2005 *National Cable & Telecommunications Association v. Brand X* case the US Supreme Court ruled that based in part on the FCC's previous rules, providers should

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[154] Crawford, *Captive Audience,* 55.
[155] Ibid., 56.
[156] Federal Communications Commission, "FCC Classifies Cable Modem Service as 'Information Service': Initiates Proceeding to Promote Broadband Deployment and Examine Regulatory Implications of Classification"; Patel, "The Wrong Words."
[157] Federal Communications Commission, "FCC Classifies Cable Modem Service as 'Information Service': Initiates Proceeding to Promote Broadband Deployment and Examine Regulatory Implications of Classification."

not be considered common carriers and were under no obligation to allow access from other ISPs.[158] Following the *Brand X* supreme court decision in 2005, the FCC issued a series of broadband policy statements emphasizing access to lawful content, application and device use as well as competition among network, application, service and content providers.[159] Despite this gesture toward neutrality, accusations of blocking and throttling emerged. Not only after the 2005 policy was adopted, the FCC began investigating accusations from VoIP provider Vonage that a small ISP, Madison River Communications, was blocking its service to benefit Madison River's own phone services.[160] In response, the FCC initiated an investigation of the blocking, but the ISP agreed to stop targeted blocking and paid a voluntary fine to have the accusations dismissed.[161]

2.5 A new hope?

Network neutrality gained prominence in national U.S. politics when in October 2007, then-Senator Barack Obama, while running for the Democratic nomination for the 2008 Presidential election, said he claimed support for net neutrality and would appoint FCC officials who also supported the policy.[162] During the 2008 campaign, Obama's position stood in stark contrast to that of Republican John McCain, whose platform rejected new regulations on Internet providers in favor of voluntary access promotion agreements.

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158 Crawford, *Captive Audience*, 56–57.
159 Nunziato, *Virtual Freedom*; Federal Communications Commission, "Policy Statement."
160 Marsden, *Net Neutrality*, 35.
161 McCullagh, "Telco Agrees to Stop Blocking VoIP Calls - CNET News."
162 Broache, "Obama Pledges Net Neutrality Laws If Elected President."

By May 2009, net neutrality returned to the political spotlight. In a speech on cybersecurity, President Obama reaffirmed his commitment to Network Neutrality while emphasizing that his "administration will not dictate security standards for private companies. On the contrary, we will collaborate with industry to find technology solutions that ensure our security and promote prosperity."[163]

The FCC's 2010 loss in a legal challenge to Comcast forced Chairman Julius Genachowski to further clarify the FCC's net neutrality position. Since 2007, the FCC had taken part in an ongoing legal debate (spanning the Bush and Obama administrations) in which the commission censured Comcast after the cable provider was accused of throttling peer-to-peer web traffic.[164] In early 2010, a federal appeals court ruled in *Comcast Corp. v. FCC* in the cable company's favor, arguing the FCC's policy statement was not sufficient to penalize Comcast's actions. In other words, if the FCC wanted to set network neutrality rules, they would have to set forth an explicit order, rather than a vague policy.

With the Comcast case as the background, Genachowski outlined new, clearer neutrality rules. The chairman emphasized the need for rules to preserve an open Internet and those established rules would serve as the basis for case-by-case enforcement of policies by the FCC.[165] The FCC's 2010 Open Internet Order consisted of three rules intended to build on the four neutrality-like 2005 policies.[166] The order

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[163] Obama, "Remarks by the President on Securing Our Nation's Cyber Infrastructure."
[164] Wyatt, "U.S. Court Curbs F.C.C. Authority on Web Traffic."
[165] Genachowski, "Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity."
[166] Federal Communications Commission, *Report and Order In the Matter of Preserving the Open Internet Broadband Industry Practices*.

included three elements: transparency, no blocking and no unreasonable discrimination. Under the order, internet providers would be held to a new standard of transparency regarding network management practices, though they would not be required to reveal sensitive business information. Next, the rule prohibited blocking content online. Finally, the rule prohibited providers from discriminating, slowing, or disfavoring of lawful content. The latter two rules include exception for "reasonable network management" which as is noted in later chapters, has become a contentious issue.[167] The Chairman defended these policies in 2011 before the House of Representatives Committee on Intellectual Property, Competition and the Internet arguing they were necessary to ensure fairness and competition online.[168]

NN in the U.S. remained relatively stable and under-the-radar until the announcement of the 2014 *Verizon vs. FCC* ruling formally decisively throwing out the 2010 open internet orders. Despite the ruling's elimination of the existing network neutrality orders, the Obama administration argued it would continue to support open internet policies. In a virtual forum event, Obama emphasized his continued support for NN as well as his confidence in recently appointed FCC chair (and former telecom investor) Tom Wheeler's commitment to the issue.[169] Despite this recommitment to the issue, Wheeler emphasized the FCC would neither appeal the *Verizon* ruling, nor would it immediately reclassify internet services as a common carrier protected telecommunications service but instead seek to use commissions newly-confirmed

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[167] Ibid.
[168] FCC Panel, *Ensuring Competition on the Internet*.
[169] Brodkin, "Obama on Net Neutrality."

regulatory powers confirmed in the ruling.[170] Less than a month after the Open Internet Order was issued, telecommunications giant Verizon filed suit with the United States Court of Appeals for the District of Columbia claiming the agency's order overstepped its authority to regulate the web based on the FCC's previous rulings.[171]

2.6 Back to the drawing board

After years in court, the US Court of Appeals ruled in favor of Verizon in January 2014. In the decision, the court arguing that while the FCC had jurisdiction to regulate internet services (under the 1996 Act's Section 706,) but blocking and discrimination prohibitions of the 2010 Open Internet Order were too similar to common carriage regulations and therefore were dismissed.[172] The decision was clear: the US would need to find a different approach for preserving network neutrality.

In February 2014, recently-appointed FCC Wheeler outlined the FCC's new approach which included: Retooled nondiscrimination, anti-blocking and transparency rules; new attempts to examine reclassification; seek public comment; and support growing public and local competition to ISPs.[173] To the concern of NN advocates, the FCC's initial proposal also suggested opportunities for ISPs to create "fast lanes" – channels of web traffic that could be treated differently than existing internet service.[174] While the commission continues to accept comments regarding the proposed rules, in a

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[170] Puzzanghera, "FCC Won't Appeal Net Neutrality Ruling, Will Again Try to Rewrite Rules."
[171] Wyatt, "Verizon Sues F.C.C. over Order on Blocking Web Sites."
[172] Wagstaff, "Verizon Wins, Net Neutrality Loses, as Court Ruling Opens Door to a Tiered Internet - NBC News.com"; Verizon v. FCC, 740 F. 3d 623 (Court of Appeals, Dist. of Columbia Circuit 2014).
[173] Wheeler, "Statement by FCC Chairman Tom Wheeler on the FCC's Open Internet Rules."
[174] Bilton, "Disruptions."

congressional hearing Wheeler claimed "fast lanes" would violate the "commercially reasonable" wording of the FCC's proposed rules.[175]

While reclassifying broadband as a telecommunications may be potentially disruptive, few options are left for enforcing equal network access and non-discrimination. Following the *Verizon* ruling open-internet advocates and organizations like the Electronic Frontier Foundation (EFF), which have previously resisted endorsement of reclassification, announced their public support for applying common carriage rules to the web.[176] McMillan suggests reclassification may be one of the FCC's only options for re-balancing the power between ISPs and users:

> [Reclassification] would give the FCC the regulatory teeth needed to keep internet access open in a reasonable way to make sure that service providers don't grow into kingmakers—deciding which online companies can flourish on the net and which can't."[177]

With the potential of reclassification remains open, legislation has been introduced to the US House of Representatives that would ban reclassification before it could occur.[178] In fact, a number of bills - both supporting and opposing network neutrality – have been introduced in the US congress in 2014, but given its recent gridlock, these are

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[175] Fung, "FCC Chair: An Internet Fast Lane Would Be 'Commercially Unreasonable.'"
[176] McSherry, "The FCC and Net Neutrality"; Open MIC, "Comment of Open Media and Information Companies Initiative (Open MIC), et Al Submitted before the Federal Communicaions Commission in the Matter of Proposed Rulemaking Promoting and Protecting the OPen Internet GN Docket No. 14-28"; Brodkin, "Make ISPs into 'Common Carriers,' Says Former FCC Commissioner."
[177] McMillan, "The Case for Net Neutrality's Nuclear Option."
[178] Eggerton, "Latta Bill Would Block Title II."

probably more likely to be political gestures rather than realistic solutions.[179] It should be noted that telecom corporations have invested a tens of millions of dollars into lobbying against network neutrality and in 2013 anti-neutrality donors outspent pro-neutrality lobbyists 3-1.[180]

2.7 Conclusion

In attempting to both regulate and promote the economic success of both involved industries (not to mention satisfy the public's demand for fast, reliable and affordable Internet access,) the U.S. government leadership and the FCC are in the uncomfortable position of attempting to satisfy all involved parties. While legislators in congress have visited the issue on a number of occasions and proposed a handful of unsuccessful bills both for and against more formal neutrality, there appears to have been little incentive by lawmakers to pursue the issue further.[181] This chapter's historical overview of US network neutrality policy has shown that combination of elements has denied, diluted, delayed, or dismissed attempts to codify clear, firm non-discrimination rules. While there have been attempts to expand these principles, they have been instead thwarted by competing interests. The result has been piecemeal steps toward creating a relevant and enforceable network neutrality policy. These half-measures in lieu of more robust policy culminated in the 2014 *Verizon* ruling nullifying the FCC's 2010 attempts at a establishing a neutrality standard.

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[179] Ibid.; "McCain Introduces Bill to Block FCC's Net Neutrality Rules"; Finley, "Democrats Aim to Reinstate Network Neutrality With New Bill"; Fung, "Democrats Unveil Legislation Forcing the FCC to Ban Internet Fast Lanes."
[180] Drutman and Furnas, "How Telecoms and Cable Have Dominated Net Neutrality Lobbying."
[181] Gilroy, "Access to Broadband Networks."

Previously, the FCC's minimalist and non-binding approach to NN relied on the continuing norms of non-discriminatory content treatment, competition between market actors and the development of architecture encoded with these priorities. However, each of these in their current condition is not enough to preserve NN across the web. Examining each of these three aspects of network neutrality separately and in relation to similar conditions throughout the world gives a clearer vision of the structure of online interaction and governance as well as a potential vision for its future.

3 NEUTRALITY AND ARCHITECTURE

This chapter examines the architectural regulation of network neutrality. In particular, it highlights both the power and malleability of architecture as a tool for regulating behavior. While some elements of the internet architecture like end-to-end protocols appear to encourage content non-discrimination, other elements like the infrastructure for managing these increasingly-popular networks have also been used to exert unprecedented power of communication flows. The infrastructure of the web extends great distances and consists of many levels of both physical and digital structures. In Australia and New Zealand there have been attempts to reshape the architecture of the internet through new high-capacity infrastructure initiatives, but while these new architectures are different from those in the US, so far they appear to have done little to affect the power imbalances between network operators and users.

3.1 An invisible regulator

Architecture is an incredibly influential but sometimes-invisible aspect of the Internet ecosystem. Features built into the architecture of the web have shaped network neutrality's existence and undoubtedly will shape its future. This architecture includes not only the physical connections within and between networks, but also the protocols that dictate how information is handled as it moves between users.

Internet architecture is generally sorted into organizational levels called "layers," each of which pertain to different aspects of the information transport system. There

have been many attempts at creating an ideal layers model.[182] Most generally accepted models describes four such layers: the physical infrastructure (computers, routers and cables,) the logical or protocol layer, the application layer (such as a website or application or media player) and content (the actual information being sent and received).[183] While each of these layers is important for the design and execution of globally connected computer networks, the next sections focus in particular on the first two: the physical infrastructure layer and the protocol layer.

Incremental architecture choices during the internet's growth both allowed for the development of network neutrality just as similar choices by network operators are increasingly eroding that same neutrality. This can be seen in the shift of guiding protocols from an earlier end-to-end to more current quality-of-service questions of which focus less on equality of transmission than on network management.

In the US, these shifts away from neutrality are also seen in the concentration and powerful role infrastructure owners and organizations have taken in determining the shape of the web. However, not all internet infrastructures are created or managed equally. In the past, these network owners and operators have claimed neutrality stands in the way of future development, but the cases of new centralized broadband architecture projects in Australia and New Zealand call these assumptions and the larger role of architecture in internet regulation into question.

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[182] Thierer, "Are Dumb Pipe Mandates Smart Public Policy - Vertical Integration, Net Neutrality, and the Network Layers Model," 277; Lemley and Lessig, "The End of End-to-End," 6; Wu, *The Master Switch: The Rise and Fall of Information Empires*, 585; Cerf, "The Open Internet: What It Is, and Why It Matters," 18.2; Lehr and Chapin, "On the Convergence of Wired and Wireless Access Network Architectures," 38.

[183] Whitt, "A Deference to Protocol," 732–734.

3.1.1 Building for openness, or control

Lessig argues that the modality of architecture in cyberspace, consisting of structure and protocol choices, is particularly powerful for determining user behavior and the networks' potential.[184] The structure and rules guiding how these networks operate is neither accidental nor is it discovered, but instead the result of conscious choices codified into the system.[185] Not surprisingly, these architectural choices may also be the result of policy guidance, market forces, or established norms. As the desires of network managers or users change, so do the networks themselves. Some computer networks may be both programmed to promote content openness and increased access. Others work to maintain censorship and steer traffic to enrich those controlling the networks. Changes to these networks are often made by a small group rather than publically negotiated and those choices form a kind of invisible, privatized law regulating behavior.[186]

Lessig notes that depending on these structural choices, architecture may be wielded as a tool for information freedom or repression:

> If some architectures are more regulable than others—if some give governments more control than others— then governments will favor some architectures more than others. Favor, in turn, can translate into action, either by governments, or for governments. Either way, the architectures that render space less regulable can themselves be changed to make the space more regulable.[187]

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[184] Lessig, "The Law of the Horse," 529.
[185] Lessig, *Code,* 6.
[186] Lessig, "The Law of the Horse"; Lessig, *Code*.
[187] Lessig, *Code,* 24.

In other words: when parameters of behavior are dictated by the architecture, rather than through explicit laws, design principles become substitutes for public policy. Lessig suggests the public should consciously consider whether online architectures reflect the values and needs of the larger public, rather than the choices of network programmers and operators.[188] He argues this balance justifies the actions of regulators to reconcile network design with public needs.[189] But as the ongoing network neutrality debate shows, the process of changing code is rarely that simple.

While Lessig and others have said the origins of the internet are based in the principles of content non-discrimination and reasonable access online, the malleability of internet architecture and infrastructure means those principles are far from guaranteed. Instead, the weakening of the network neutrality principles embedded in the internet's architecture is the result of choices by powerful network operators to favor their own control or profits over the needs of the public at large.

3.1.2 Building neutrality

The design and structure of the internet is incredibly complex and technical, but unpacking the primary discussions regarding its protocols and physical infrastructure is vital for unpacking architecture's affect on network neutrality. This chapter examines some of the most conspicuous architecture issues supporting and sometimes hindering NN. The Internet has changed immensely since it's beginning. The initial design of the internet – going as far back as its Defense Department and academic origins with ARPANET – was based on a decentralized structure enshrined in the non-

[188] Lessig, "The Law of the Horse," 529.
[189] Ibid., 532.

discriminating, first-come-first-serve protocols of TCP/IP programming.[190] Protocols like HTTP and SFTP were designed for all types of users to openly access, develop for, and create content and they continue to be used today.[191] For these reasons, neutrality advocates argue the internet was built on a foundation of network neutrality.

But NN opponents argue today's demands on the internet require new approaches and designs and offer a handful of claims to justify greater control of how users access the web. They claim the physical costs of internet infrastructure and the burden of the web's heaviest users warrants new tools and policies for managing how information moves across the networks. In addition to the cost of physical architecture, they argue the changing nature of web 2.0 and increasingly demanding applications (like video streaming, VoIP, IPTV, etc.) warrant more complex procedures, mechanisms, and protocols.[192] ISPs and network operators claim the heaviest users stress the network and penalize average users by occupying a fixed amount of bandwidth and transmission space while still paying the same rates.[193] They also claim strong network management allows for content and applications online, while potentially arbitrary regulations on these tools may have unforeseen and potentially harmful effects on the future development of the network of networks.[194]

But it remains worth considering whether increased network management ultimately serves the needs of internet's users or merely enriches private corporate

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[190] Wu, *The Master Switch: The Rise and Fall of Information Empires*, 381.
[191] Zelnick, *The Illusion of Net Neutrality*, 88.
[192] Lee and Kim, "The Effects of Network Neutrality on the Diffusion of New Internet Application Services," 386.
[193] Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo," 95.
[194] Geddes, "Network Neutrality"; Yoo, "Is There a Role for Common Carriage in an Internet-Based World?".

network operators and owners. Because the internet was initially built with public resources, there is a legitimate claim that decisions regarding its use and design should be made with the public's interest primarily in mind.[195] However, understanding the many levels upon which these decisions can be made requires a more sophisticated explanation of the internet's architecture.

3.1.3 An ally or a threat

At its simplest, internet networking is a system which allows information broken into electronic packets to be transferred from a computer in one location to another computer in another location and vice versa.[196] These computers may be directly connected to each other, but more often the information travels across great distances, changing hands through multiple routing devices and networks. The protocols of the internet are designed to move data to the first available open path, however direct, or indirect it may be from its intended destination.[197] Generally, internet protocols are designed to move data in most direct path to its destination, but if networks are congested that same data may be sent on a more complex or longer path if that path becomes open first.

However, the features of both the physical and protocol layers continue to change as the network management tools become more sophisticated. Network owners may respond to user traffic by prioritizing protocols to encourage particular types of behavior that services there interests. For example, smart networks may send certain

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[195] Freedman, "Outsourcing Internet Regulation," 98.
[196] Latham, "Networks, Information, and the Rise of the Global Internet."
[197] Latham, "Networks, Information, and the Rise of the Global Internet."

types of data (like prioritized video) on direct paths, while less desired data (like peer-to-peer transfers) is sent to longer, slower routes. Similarly, the physical infrastructure of the internet, made possible through complex technological and economic connections, affects how quickly and efficiently data moves between users and across networks. The types of connections available and the agreements between infrastructure owners like backbone providers and last-mile network providers affects how easily and affordably users can connect to each other. Without network neutrality rules, the manipulation of protocols and infrastructure by network owners / operators is a particularly invisible and powerful tool for altering or blocking the movement of content online.

3.2 Protocols: equality versus quality

To highlight the malleability of internet architecture and its flexibility to function as both a foundation for network neutrality or the source of its undoing, I will highlight two competing protocols which operate within the TCP / IP system. On the one hand, the End-to-End (or e2e) model emphasizes the role of senders and receivers on each "end" of a digital communication with little network interference in between. On the other, Quality of Service (or QoS) emphasizes measures within a network to ensure transmissions are received fully and accurately. McKelvey notes the choice to structure networks focus on either protocol may result in significant effects:

> The E2E model overlooks the connections, but fully recognizes the ends. The QoS model devalues the ends as contributors to the network in favour of centralized hubs serving content and ensuring proper transport. These tensions are political—a source of conflict, not consensus."[198]

[198] McKelvey, "Ends and Ways," 65.

Each of these models offers benefits and consequences for both users and network operators with widely different implications for network neutrality.

3.2.1 End to end

The end-to-end model has served as the basis for the open, interconnected architecture of the Internet.[199] It describes one of the most basic elements of the packet switching algorithms that constitute the TCP / IP systems still used online today. In the most basic sense, e2e focuses encoding and decoding at the computer it is sent and received, rather than being processed at an intermediary during transmission. This process, outlined by David Reed, David Clark, and Jerome Saltzer in the 1984 paper "End-to-End Arguments in System Design," downplays the importance of the network itself and instead relies on the "ends" for processing the information.[200]

Vinton Cerf, one of the developers of the TCP / IP protocols argues this pattern was chosen intentionally:

> The Internet was designed to allow applications to reside essentially at the 'edges' of the network, rather than in the core of the network itself. This is precisely the opposite of the traditional telephony and cable networks, where applications and content are implemented in the core (in headends and central offices), away from the users at the edge.[201]

But the success of this style of protocol was not guaranteed during the development of early computer networking technologies. Between the 1970s and 1990s other competition included Open Systems Interconnection (OSI) protocol, which

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[199] Whitt, "A Deference to Protocol."
[200] McKelvey, "Ends and Ways," 59; Wu, *The Master Switch: The Rise and Fall of Information Empires*, 449.
[201] Cerf, "The Open Internet: What It Is, and Why It Matters."

favored more centralized network processing and slower, less versatile (but more reliable) data transfer protocols.[202] Ultimately, TCP / IP's usability and popularity among both professionals and enthusiasts along with its ability to work on many physical platforms contributed to its ultimate success and growth.[203] At the time, OSI offered better tools for network security and had slowly begun to gain popularity, particularly among European governments, but TCP / IP's established reputation and proven interoperability / compatibility led to its popularity over the other competing protocol suites.[204]

Lessig has argued the simplicity of the internet's e2e architecture is a key factor in its success.[205] He notes the flexibility of e2e allows for maximum participation within the network – which ultimately contributes to its overall value.[206] This design structure allows the infrastructure to remain relatively simple while pushing "complexity to the edge of the network—to the applications that run on the network, rather than the network's core."[207] This principle serves as the basis upon which a great deal of pro-network neutrality arguments rest: that interference through blocking, discrimination or altering of content as it travels across a network interferes with the original design principles of the internet.[208]

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202 Latham, "Networks, Information, and the Rise of the Global Internet," 158.
203 Ibid., 164.
204 Maathuis and Smit, "The Battle between Standards," 169–173.
205 Lessig, *Code*, 44.
206 Ibid., 195.
207 Ibid., 44.
208 Wu, "Network Neutrality, Broadband Discrimination"; Lemley and Lessig, "The End of End-to-End."

The simplicity of e2e may be both its greatest strength and weakness. By design, packets transmitted using e2e design are sent and received "first-come, first-serve" regardless of the content it is transporting. Marsden notes "E2E is a two-edged sword, with advantages of openness and a dumb network, and disadvantages of congestion, jitter and ultimately a slowing rate of progress for high-end applications such as high definition video."[209] Pure end-to-end, first-come, first-serve transmission relying only on the basic TCP / IP protocols may be disastrous for more advanced and data-heavy applications.[210] In some ways, the network congestion, which network operators argue justifies increasingly intrusive traffic management methods, is in part the result of the internet's original e2e protocols.[211]

To illustrate this, briefly consider how they may apply to a different form of traffic – auto traffic. Imagine a hypothetical highway between two cities that follows a pure e2e design. This highway would have no speed limits, no traffic signals, and no customs for managing traffic such as slower vehicles keeping in the outside lanes. If all vehicles traveling on the highway are relatively equal, they may all be able to travel more easily (and possibly efficiently) than on a managed highway. However, as different types of vehicles like large trucks (VoIP) or slower, heavy equipment (streaming video) enter the highway, the ability to use the road optimally will reduce. The only e2e solutions available would be to construct additional roads between the cities or widen the existing road (increase bandwidth.)

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[209] Marsden, "Network Neutrality," 110.
[210] Yoo, "Network Neutrality and the Economics of Congestion," 1862.
[211] McKelvey, "Ends and Ways," 58.

Because of these concerns, both neutrality supporters and opponents accept some degree of network management. Increasingly large and sensitive types of content and growing user numbers has warranted the need for new protocols for managing the internet. These new principles have increasingly become just as significant to the Internet as the e2e principles found within TCP/IP. But while these management protocols bring order to the potential chaos of a pure e2e network, they also open the door for potential abuse by network owners.

3.2.2 Quality of service

In response to the congestion of first-come, first-serve data transmission by the web's original e2e protocols, network owners have increasingly implemented algorithms to manage data as it travels through their switches, servers and systems. These Quality of Service ("QoS") protocols preserve a basic expectation of service based on access to a given network and ensure traffic of greatly different needs is delivered successfully.[212] With some web services (video streaming, large downloads, etc.) requiring more bandwidth than others, network owners argue they need tools to manage how bandwidth is used to ensure all customers receive a basic level of connectivity.[213]

The specific types of QoS algorithms used have significant effects on the travel of data. Some may schedule how often certain types of data are allowed to move, others shape traffic by spreading packets rather than allowing them to come all at once, others

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[212] Ibid., 59.
[213] Krämer, Wiewiorra, and Weinhardt, "Net Neutrality."

may block or prohibit certain types of traffic altogether.[214] In that sense, some low-level content discrimination is already built into today's internet networks. Today's ISP routers are designed to prioritize (or buffer) certain types of traffic over others with time-sensitive packets, like video conferencing, are put ahead of regular traffic like visiting a website or watching a small video.[215]

While some oppose any network discrimination, a basic level of QoS management is acceptable to most NN supporters, though the limits of what constitutes an "acceptable" management remains up for debate.[216] Without some QoS management, data-intensive services (VoIP and Video Streaming) would be inefficient or impossible given the existing internet bandwidth for most users.[217] For this reason, some argue traffic management and other QoS processes are vital to the continued innovation of the web and its increasingly central role in the midst of technological convergence.[218]

Network providers and ISPs have invested heavily in technologies like Deep Packet Inspection (DPI) for transmitting, managing and identifying types of packets with increasing accuracy.[219] These QoS technologies also give ISPs and networks tools to pick and choose some content over others. In an example from 2008, when the FCC responded strongly to Comcast's data tracking and deliberately reducing of bandwidth ("throttling") of Peer-to-Peer users, the company responded by instituting usage caps in

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[214] Peha, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*, 5–6.
[215] Marsden, "Network Neutrality," 86.
[216] Wu, "Network Neutrality, Broadband Discrimination"; Lessig, "In Support of Network Neutrality"; Brown and Marsden, *Regulating Code*, 143.
[217] McKelvey, "Ends and Ways."
[218] Zelnick, *The Illusion of Net Neutrality*, 153–155.
[219] Brown and Marsden, *Regulating Code*, 142, 177.

the name of QoS.[220] Peha argues "it is cost-effective for a network operator to gain unprecedented knowledge about what is happening on the network, and to selectively improve or degrade service for some."[221] This may be as light as monitoring use to gather advertising information or as drastic as censoring certain content. Mueller and Asghari suggest the publicity from incidents like the Comcast case may lead to greater public scrutiny of ISPs and their monitoring, fostering reductions in the reported use of DPI technology.[222]

As will be discussed below, these QoS technologies like DPI can be mobilized beyond commercial uses. They may also be used as tools for political surveillance and censorship. The accuracy of this technology allows ISPs to identify and slow politically sensitive or illegal data, or isolate user data for more accurate marketing or advertising.

The emphasis by network owners on QoS echoes the initial concerns of telephone and telegraph networks concerned about the clarity of transmissions and methods for improving transmission rates and reducing congestion.[223] The creation of ARPANET and its decentralized e2e transmissions was a radical shift from previous communication networks. Some have argued, dramatic increases in last-mile bandwidth may reduce or eliminate the need for service-management algorithms.[224] Despite this speculation, unless there is strong intervention from regulators or public outcry, there is little reason to believe technologies like DPI will become less prevalent

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[220] Brown and Marsden, *Regulating Code*.
[221] Peha, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*.
[222] Mueller and Asghari, "Deep Packet Inspection and Bandwidth Management."
[223] McKelvey, "Ends and Ways," 59.
[224] Isenberg, "The Dawn of the Stupid Network."

as network owners see opportunities to exert more control over networks. The historical pattern of network owners has been one of control, management and monetization rather than restraint.

3.3 Infrastructure: the physical web

Internet protocols may be different than those of previous communication technologies, they often travel on the infrastructure of legacy networks and the structure of these networks and their ownership has had significant effects on network neutrality. While today's in the US is not dominated by a single monopoly like AT&T once dominated the telephone market, some have argued a similar level of network control now exists in the hands of a handful of broadband providers.[225] Telephone-style network policies were designed with relatively consistent information loads, with the exception of a few dedicated lines. Users who needed more access to the phone network purchased more individual lines.

In the 1970s with the advent of fax machines, telephone text transmission, and computer networking across telephone lines, new policies had to be created to deal with these new architectural needs. Any shift away from NN and flat rate pricing represents a shift away from how information networks have so far been regulated by the FCC.[226] As computer networks play an increasingly large role and as their infrastructure is adapted and updated to face increasingly large information and content loads, the legacy of previous structural and technology choices remains.

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[225] "Sender-Side Transmission Rules for the Internet."
[226] Cowhey, Aronson, and Abelson, *Transforming Global Information and Communication Markets the Political Economy of Innovation*, 114.

3.3.1 Connecting the tubes

As discussed in chapter two, the expansion of these computer connections across phone lines was enabled by *Carterphone* and *Hush-a-Phone* rulings which allowed users and businesses to connect modems and computers directly to telephone networks and ultimately the internet. Previously these connections were only available to academic institutions and the largest corporations who leased access to the AT&T wires. In the wake of the 1984 break up of AT&T, interconnection allowed these connections to continue and flourish. The flexibility of TCP / IP networking meant many types of network technologies could be connected to other networks and ultimately to create a global internet. In the late 1970s and 1980s the majority of the internet consisted of university and government agencies, early consumer modems and internet services began to emerge.[227]

In 1985, the National Science Foundation Network (NSFNET) was created to link academic supercomputers across the US using TCP / IP protocols and grew to become part of the foundation of the modern internet backbone.[228] The network was dedicated to the distribution of research and scholarly work, built with a combination of public and private partnerships grew to reach across the country and grew to offer connections to 16 research institutions and multiple regional networks.[229] In 1997 NSFNET was

[227] Wu, *The Master Switch: The Rise and Fall of Information Empires*, 398.
[228] Internet Society, "Brief History of the Internet - Internet Timeline."
[229] Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo," 82.

privatized and replaced with connections to privately-operated backbone networks, and regional networks were replaced by regional ISPs.[230]

The first consumer online service, CompuServe was launched in 1979 and offered basic text information, news and early email service to users who paid by the minute and connected through dial-up modems.[231] Other consumer dial-up services like the UNIX-based USENET bulletin board service also began to grow in popularity during that time.[232] Through the '80s and '90s Consumer internet access use continued to grow competition came from a variety of connection types including dial-up connections through telephone lines where customers could choose an ISP among a variety of providers, DSL which also operated on existing telephone network or cable internet which transmitted through existing cable television infrastructure.[233]

Just as architecture allows certain types of behavior, policy is a reflection or rebuttal to these designs. The 2003 FCC Cable Internet Order that declared internet services operating on telephone lines as not subject to common carrier protections are one such example. While the flexibility of the web to adapt to a wide variety of already-established communications networks has been a feature of internet technology, the historical regulatory approaches linked to those legacy networks has had a significant impact on network neutrality / open internet discussion. Questions of common carrier access or private network control have been raised about these legacy networks. While broadcast and cable networks have historically and legally been found to have a degree

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230 Ibid., 82–83.
231 Tweney, "Sept. 24, 1979."
232 Wu, "When Code Isn't Law."
233 Crawford, *Captive Audience*, 52–53.

of independence in content choice as far back as the Communications Act of 1934, likewise telephone and telegraph networks were held to non-discrimination rules like common carrier.[234]

While Internet technology is sui generis, policy approaches to it reflect those made about previous technologies. Thus the NN debate, is in part about whether the internet communication networks are more similar to telecommunications networks (connecting users to users) or cable / broadcasting networks (connecting content providers to users.) The reality is much more complex. The Internet 's architecture reflects aspects of both of these and more. This is particularly apparent when looking beyond ISPs and users to the larger institutions and networks that make up the global Internet infrastructure.

3.3.2 Interconnection and peering

The physical connections and structure of the internet have continued to change as well, becoming increasingly sophisticated and complex. Most NN discussions have focused on the "last mile" or the connection between customers and the larger network. In the case of wired broadband in the US, these connections are largely through digital subscriber line (DSL) operating through telephone wires, coaxial (cable) connections, or fiber-to-the-premises (FTTP) service. The first two operate in part on the infrastructure of previous to-the-home technologies (cable television and telephone service) that have been adapted and upgraded to allow high-speed information transfer while the latter often requires brand-new infrastructure and connections to homes or businesses.

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[234] Yoo, "Network Neutrality and the Economics of Congestion," 1905–1906; Wu, *The Master Switch: The Rise and Fall of Information Empires*.

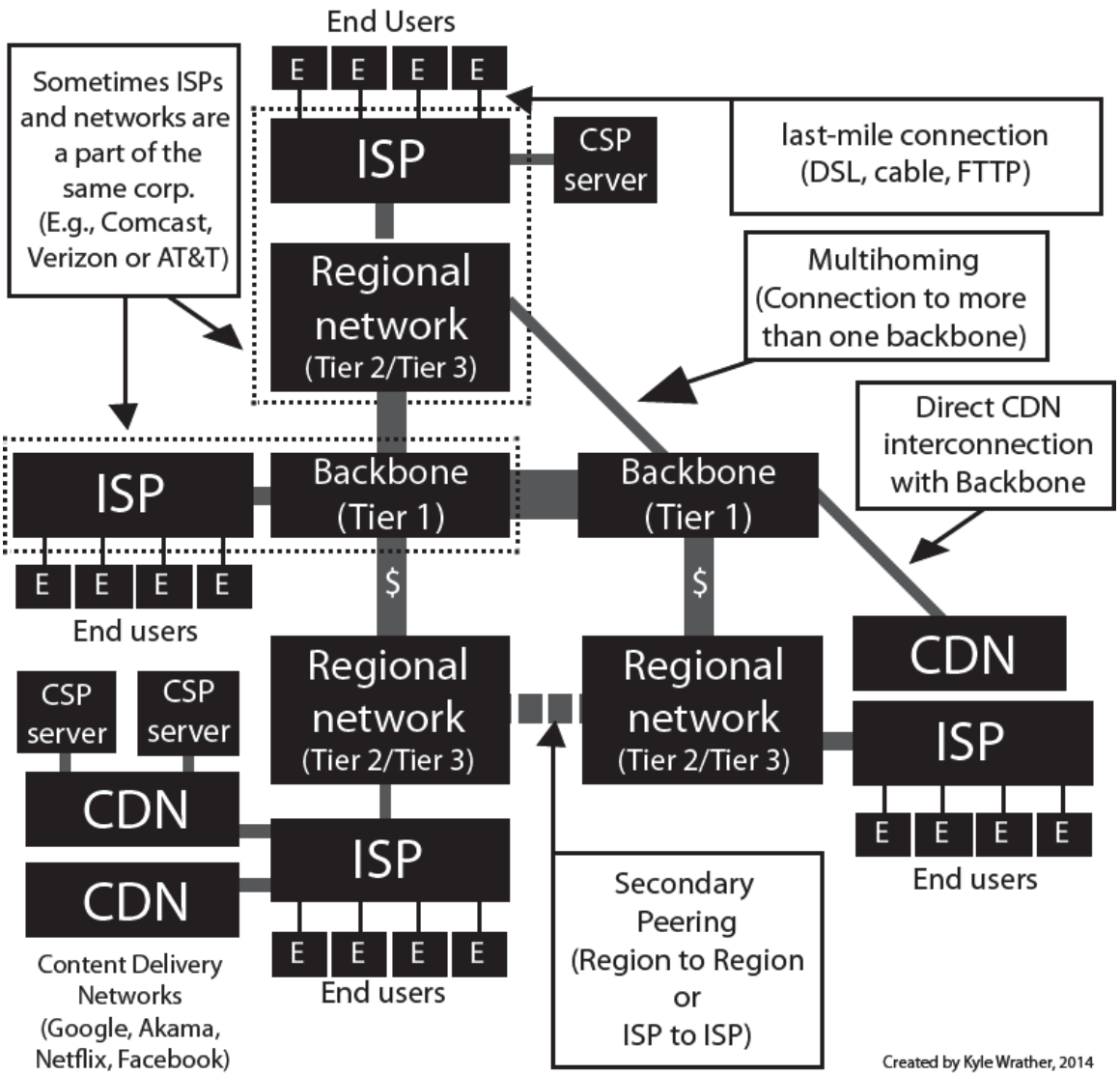

Figure 3.1 A diagram of complex infrastructure relationships.

Beyond the "last mile" the network and its connections becomes much more complex (see Figure 3.1). Last-mile network operators (which are almost all now ISPs or companies connecting users to the larger internet-based network) are connected through fiber-optic cable to a variety of networks including other networks, often called the "middle mile."[235] The largest of these are Backbone (Tier 1) providers, including

[235] Marsden, "Network Neutrality," 90.

AT&T, Verizon, Level 3 and TeliaSonera, which provide the largest, and longest connections across land and sea.[236] Because they transmit huge, fairly equal amounts of data these Tier 1 providers connect and share data through free peering agreements.[237] Because they reach a smaller number of users, regional (Tier 2 or 3) networks, like Vodafone or even Comcast, may pay Tier 1 providers for access to their larger networks.[238] These payments are called transit or interconnection agreements.

While not classically regarded as NN, these agreements as well as the implementation of Content Delivery Networks (CDNs) ultimately affect the movement of information online, data congestion and ultimately the need for neutrality regulations. As CSPs have grown increasingly large and popular, they have increasingly relied on the implementation of CDNs or servers directly connected to backbone or ISPs that allow information to move directly within the ISP's network instead of across potentially thousands of miles.[239] In lieu of direct pricing tiers based on content users access, ISPs and CSPs have increasingly negotiated these partnerships for the heaviest or most time-sensitive online applications. Notable participants include Google, ESPN, Microsoft, and Netflix, the latter of which has publically opposed CDN pricing in a series of public dust-ups with both Comcast and Verizon.[240] In part these public disagreements stem from content providers attempting to negotiate

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[236] Winther, *Tier 1 ISPs: What They Are and Why They Are Important*; Shah and Kesan, "The Privatization of the Internet's Backbone Network."
[237] Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo," 86–87.
[238] Center for Applied Internet Data Analysis, "AS Rank: AS Ranking."
[239] Clark, "[Special Section on Net Neutrality] Network Neutrality"; Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo."
[240] Brodkin, "Netflix Packets Being Dropped Every Day Because Verizon Wants More Money"; Lyons, "Comcast, Netflix, and the Unregulated Interconnection Market"; Rayburn, "Chart Shows Which Content Owners Have Direct Interconnect Deals With ISPs."

interconnection with backbone providers like Cogent or Level 3 without brokering similar deals with last-mile ISPs.

These agreements are potentially a strong deviation from the classic conception of fair and reasonable information transport.[241] Because of the dearth of last-mile service providers, ISPs have incredible leverage to charge whatever they like in exchange for fast transport. Under this system, Marsden argues "content is therefore already delivered at different speeds depending on the paid priority the content provider assigns to it, but not the ISPs' policies."[242] These CDN and interconnection agreements echo the programming negotiations between cable providers and content channels[243] In fact, Comcast has leveraged its large infrastructure and huge last-mile user base to negotiate peering agreements with most Tier 1 networks and only pays a minor transit agreements fee for international connections.[244]

Many (including open-internet advocates) argue CDNs add value to user experience online and for the most part do not negatively affect the last-mile of internet service.[245] However, these agreements may endanger network neutrality in the long term. Feld argues premium service agreements and interconnection agreements rely on

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[241] Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo," 87.
[242] Marsden, "Network Neutrality."
[243] Grove and Baumann, "Complexity in the Telecommunications Industry," 43; Crawford, *Captive Audience*.
[244] Brodkin, "How Comcast Became a Powerful—and Controversial—part of the Internet Backbone."
[245] "Sender-Side Transmission Rules for the Internet"; "Interconnection Confusion | Commentary."

bandwidth scarcity and therefore discourage ISPs from investing in faster networks.[246] Feld argues:

> The incentive for content providers and others to build CDNs and similar infrastructure is diminished if broadband access providers can block, degrade or prioritize the last mile traffic. Why bother to ship stuff express if it's going to sit three days extra on the loading dock unless I grease the palms of the broadband access provider that's supposed to deliver it? Similarly, the incentive for broadband access providers themselves to invest declines when they can 'monetize the scarcity' by charging more for prioritization.[247]

These concerns as well as the previously-mentioned Netflix-Verizon dispute in the midst of the FCC's 2014 reworking of its NN policies has led to FCC chairman Wheeler to announce the commission would examine the effects these negotiations and their impact on congestion for internet users.[248] CDN agreements represent an increasingly significant change in the how traffic moves across the internet. With CDNs for the most popular sites, data is no longer travelling across great distances, but is instead cached in ISP servers near users. As demand for faster speeds increases, content providers are faced with brokering paid interconnection agreements with ISPs or face slower speeds. Holt argues these CDNs are effectively a loophole to neutrality rules:

> While technically legal, these payments certainly flout the spirit of the 2010 Open Internet Rules, which are intended to preserve a democratic Internet and maintain similar standards of service regardless of the senders' ability to pay for a speedier delivery of their content at any point in the process. They also disadvantage smaller players who can ill afford to pay for this direct access, and consequently limit the range of creative possibilities for connected viewing.[249]

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[246] Feld, "An Examination of the Economics of Whitacre Tiering."
[247] Ibid.
[248] Federal Communications Commission, "Chairman Statement on Broadband Consumers and Internet Congestion"; Knapp and Johnston, "Internet Traffic Exchange: Time to Look under the Hood."
[249] Holt, "Regulating Connected Viewing: Media Pipelines and Cloud Policy," 21.

Without greater scrutiny of these practices or more robust network neutrality policies, infrastructure negotiations between the largest network and content providers may increasingly shape the content internet users access. Although many users in the US see little fixed broadband ISP competition, increased bandwidth through technological improvements may render concerns about congestion obsolete.

3.3.3 The end of congestion?

Dramatic changes in bandwidth capacity and traffic volume have become a staple of internet's development. In part, network neutrality opponents argue this limited capacity warrants increasingly sophisticated tools for managing content and traffic. However, some suggest congestion concerns may be overstated. For example, Hass argues that while telecommunications service and IP service are dramatically different (particularly in how they allocate traffic across networks) – network owners, which are generally telecommunications companies, continue to pursue telecom solutions like price discrimination.[250] Regardless of bandwidth improvements, dramatic increases in data compression and faster buffering may greatly reduce or greatly eliminate "congestion" as a justification for QoS tinkering or content discrimination by ISPs.[251]

As globally networked information networks continue to evolve and legacy media moves to the IP network, the policies of network owners may move away from telecom-based business strategies. The growth of investment in last-mile FTTP

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[250] Hass, "The Never-Was-Neutral Net and Why Informed End Users Can End the Net Neutrality Debates," 1614.
[251] Cringely, "Net Neutrality Is Dead, but It Probably Doesn't Matter."

networks may bring much greater bandwidth to users and at least temporarily reduce concerns about last-mile congestion. The expense of developing FTTP infrastructure may mean the total effects of this increased access may be far away. Nonetheless, roughly 22% of global internet users have fiber connections, a little over 19% use cable and the remaining 55% using copper or DSL connections according to the ITU's 2013 state of broadband report.[252]

In the US, only about 10% of US households have direct FTTP connections; instead roughly 60% of households connect to the internet through cable with, according to the FCC's 2014 Fixed Broadband Report.[253] The popularity of cable internet systems has been in part due to the existing infrastructure which provides faster speeds than DSL, with lower overhead than building fiber networks. While fiber services like Verizon's FiOS network have been plagued by expensive setbacks and criticism from investors less eager to invest capital in the costly network.[254]

The expansion of new infrastructure with greater capacity may offer one architectural answer to network neutrality concerns. New entrants like Google and some municipalities have started to construct their own fiber networks and incumbents like AT&T have begun expanding FTTP access to users to keep up.[255] This new competition from new fiber networks may pressure incumbent DSL and cable ISPs to

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[252] ITU, *The State of Broadband 2013: Universalizing Broadband*.
[253] FCC, *2014 Measuring Broadband America Fixed Broadband Report: A Report on Consumer Fixed Broadband Performance in the US*.
[254] Crawford, *Captive Audience*, 78–79.
[255] Crawford, *Captive Audience*; Talbot, "Google Fiber Apparently Is Driving Up Internet Speeds Offered by Competitors."

increase available speeds.[256] The promise of an exclusively IP-based infrastructure could eventually bring potentially lower infrastructure costs and better service. Isenberg suggests the flexibility of IP to operate on any network with little intra-network modification is one of its strengths – and that will only increase as advanced IP-based networks expand.[257]

3.4 Alternative approaches to architecture

The versatility of basic internet protocols like TCP / IP have been able to span the world connecting diverse groups with access to many different technological systems. Lantham argues "the very nature of the Internet is relatively exceptional in telecommunications history because, as an internetwork, it directly and indirectly links a diverse range of not just national but subnational, regional, and global networks."[258] Yet while these different places share common protocols, history, geography, economics, and politics have created sometimes widely different infrastructures.

Noam argues there are relationships between the need for certain types of internet regulations and the economic / infrastructure development within countries. He argues countries with existing commercial / cable networks (the US, Canada, South Korea, and European areas like Switzerland and some Scandinavian countries) require additional investment in competing network technologies.[259] In comparison, other less-developed countries offering "a single-provider copper / DSL phone infrastructure"

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[256] Talbot, "Google Fiber Apparently Is Driving Up Internet Speeds Offered by Competitors."
[257] Isenberg, "The Dawn of the Stupid Network."
[258] Latham, "Networks, Information, and the Rise of the Global Internet," 148.
[259] Eli M. Noam, "Regulation 3.0 for Telecom 3.0," 5,6.

should focus on the development fiber construction with policies encouraging open access.[260] Unfortunately, infrastructure development plans are rarely simple.

National broadband plans are not uncommon. According to the International Telecommunications Union over 134 countries had adopted national broadband plans by 2013 – these range from basic outlines of strategies for improving affordability, access, and speeds to more complex, multi-year complete overhauls of national infrastructure and policy.[261] Some of the most prominent success stories of public broadband investment strategies include Japan and South Korea, which each boast over 90% broadband penetration and lead OECD countries in fiber infrastructure.[262] The expansion of the South Korean infrastructure is in part due to the country's existing cable television coverage along with an $800 million USD infrastructure improvement investment plan completed in 2005.[263] In Japan, fiber development has been ongoing since the 1990s and competitive unbundling policies (more on those in chapter 4) have been in place since 2001.[264] It's worth nothing that both South Korea and Japan have adopted policies regarding network neutrality and traffic management.[265] Dense populations have made the rapid development of ultra-fast fiber infrastructure in these countries easier and more affordable.[266]

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[260] Ibid., 6; Marcus et al., "Network Neutrality"; Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks" I will go into the European system of network neutrality in the Markets chapter.
[261] ITU, *The State of Broadband 2013: Universalizing Broadband*, 42–43.
[262] OECD, "OECD Broadband Statistics Update."
[263] Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks," 110.
[264] OECD, *OECD Communications Outlook 2013*, 42.
[265] Ibid., 48–49.
[266] ITU, *The State of Broadband 2013: Universalizing Broadband*, 20.

While the US internet infrastructure is largely the result of a long history public development (ARPANET and NSFNET) along with the connection to private networks like AT&T and cable operators, what affordances can be offered by designing and construction a new national broadband infrastructure today and can these infrastructures instill or preserve network neutrality? The examples of Australia and New Zealand illustrate particularly ambitious approaches to improving broadband systems. Each proposes to construct separate, ultra-fast fiber infrastructures to connect the majority of their respective residents.[267]

3.4.1 Building from the ground up

The following cases examines two particular projects – the National Broadband Network (NBN) in Australia and the Ultra-Fast Broadband (UFB) project in New Zealand which both seek to overhaul their respective countries broadband infrastructure to increase access and speeds. While both represent huge investments in time and capital to re-construct broadband access, they also show that network neutrality must be actively pursued rather than neglected in favor of fast connections.

These new networks are being built in two countries where network neutrality is virtually non-existent. Instead, ISPs in Australia and New Zealand charge users based on usage or for a limited amount of content with data caps.[268] Generally, both countries have favored infrastructure unbundling and ISP competition over more formal neutrality regulations.[269] In fact, in 2008 a handful of Australian ISP leaders told the

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[267] OECD, *OECD Communications Outlook 2013*, 38.
[268] Winseck, "New Zealand's Ultra-Fast Broadband Plan"; Manwaring, "Network Neutrality."
[269] Manwaring, "Network Neutrality."

online technology publication ZDNet that NN was an "American problem" created because US ISPs offered unlimited bandwidth instead of recouping costs through usage fees.[270] In that interview, at least one ISP leader echoed the claim that fees were necessary to build faster networks, however the new government-funded broadband infrastructures in Australia and New Zealand may challenge that assertion.

3.4.2 New Zealand

New Zealand's "Ultra Fast Broadband" invested an estimated $1.1 billion in US dollars on a ten-year plan to extend fiber to nearly 75 percent of the country's residents.[271] The plan involves a massive restructuring of the internet ecosystem in New Zealand. This includes splitting the deregulated, formerly state-run monopoly provider Telecom NZ into a new company Chorus to administer the new network that is available to competing ISPs.[272] Also as part of the plan, these ISPs must adhere to a variety of transparency and non-discrimination requirements as the plan is implemented.[273]

The construction of the fiber from homes to the network was undertaken by partnerships between the state-funded Crown Fibre Holdings company and a series of partnerships with private companies.[274] Initially, the development of last-mile and backbone would be funded and constructed separately through these public-private

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[270] Winterford, Hill, and Gmt, "Net Neutrality Is an 'American Problem.'"
[271] Beltrán, "Using the Economics of Platforms to Understand the Broadband-Based Market Formation in the New Zealand Ultra-Fast Broadband Network."
[272] Ibid.
[273] Ibid.
[274] Howell, "Broadband Regulation and Government Investment in Nationwide UltraFast Fibre Broadband Networks: Evidence from New Zealand," 7.

partnerships and ultimately operated separately in addition to retail ISPs – however it became clear to regulators in 2010 that separate markets for these two elements was unfeasible.[275] Because of the cost to investors and complications of implementing this initial plan and the new strategy reduced the potential competition by making the networks more vertical.[276] The country's centralized broadband plan represents a rejection of privatization, in favor of the construction and ownership of a new state-owned infrastructure.[277]

While the development of fast fiber networks is ambitious, the prospects for the UFB's success among users remains unclear. Conditions carried over from previous internet services threaten to slow or delay the benefits of fiber expansion in New Zealand. In particular, Dwayne Winseck notes the previous heavy use of expensive and restrictive bandwidth caps in New Zealand may discourage users from seeing the need to switch to faster fiber connections.[278] While the country's government continues to pursue strategies to convince customers to switch from DSL and copper connections to fiber, they have done little to address underlying concerns like such as content discrimination and onerous data caps.[279]

3.4.3 Australia

In Australia, a similarly ambitious plan is underway, but since its introduction in 2007, the construction of the country's National Broadband Network (NBN) has faced a

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[275] Ibid., 9.
[276] Ibid.
[277] Milner, "Playing the Telecommunications Game in New Zealand," 26.16.
[278] Winseck, "New Zealand's Ultra-Fast Broadband Plan."
[279] Ibid., 168, 169.

number of challenges.[280] Geographically, extending broadband to citizens throughout the entire continent is a challenge – the plan is designed to construct FTTH in many of the most populated areas and wireless broadband or satellite connections to those in the remote Australian outback.[281] In part, the government-backed and funded design offers the promise of connecting residents who otherwise would be too costly to connect to and therefore had been avoided by commercial networks.[282] Like the New Zealand plan, the NBN provides wholesale infrastructure that will be sold to Australian ISPs like Telstra.[283]

But the NBN construction and roll-out has been difficult. The projected 2007 cost of $4.7 billion is now estimated to be over $40 billion by the plans 2020 completion.[284] By 2013 the NBN had connected roughly 800,000 residents to the new network, expecting to reach a total of 3.5 million residents by 2015.[285] The plan has also been plagued by ongoing negotiations with ISPs – namely by larger providers seeking better deals than smaller competitors. A change in government leadership has called into question the project's direction and delayed finalizing regulations for the network's governance.[286] While it is yet to be determined to what extent the NBN and its cooperating ISPs support network neutrality, measures enforcing copyright and online obscenity laws

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[280] Gerrand, "Will Our National Broadband Network Support Network Neutrality and Avoid Internet Censorship."
[281] Ibid., 15.4; Balogh, "Switkowski."
[282] Braue, "Broadband Is Not a Utility, nor Is the NBN. Discuss."; Tucker, "The Rise and Fall of Australia's $44 Billion Broadband Project - IEEE Spectrum."
[283] Gerrand, "Will Our National Broadband Network Support Network Neutrality and Avoid Internet Censorship," 15.2.
[284] Gerrand, "Will Our National Broadband Network Support Network Neutrality and Avoid Internet Censorship."
[285] OECD, *OECD Communications Outlook 2013*, 39.
[286] Durie, "Morrow Quick to Warn of NBN Fragility."

online in the country have raised concerns about potential censorship for Australians.[287] While these types of laws are not abnormal, increasingly sophisticated technological tools are available to monitor and prevent undesirable activities online.

The costly NBN rollout has also been politically divisive. While the project was designed and approved by the country's center-left Labour part, a change in government to the leadership of the center-right Coalition party left the project in far less sympathetic hands.[288] Though some Coalition leaders argued the project should be scrapped altogether, under Minister of Communications Malcolm Turnbull, NBN construction was continued but with some fiber-to-the-home construction instead reduced to fiber-to-the-node (or street corner) with copper connections made into homes.[289] This decision, while more affordable in the short run may require more costly upgrades in the long run.[290]

Interestingly, recent upheaval in US neutrality policy has drawn attention to the issue within Australia. In 2010, amid the early development of the NBN, there were calls, including from Google, for the country to clarify its position on neutrality as the US government had that year.[291] The country has never formalized network neutrality and instead most ISPs offer explicitly non-neutrality "free zone" content like movie

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[287] Moses, "Creating Parallels in the Regulation of Content," 595, 597.
[288] Braue, "Broadband Is Not a Utility, nor Is the NBN. Discuss."
[289] Ibid.
[290] Tucker, "The Rise and Fall of Australia's $44 Billion Broadband Project - IEEE Spectrum."
[291] Lohman, "CeBIT 2010: Google Renews Net Neutrality Call | Network World."

downloads from the ISPs partners which don't count against users' metered download limits.[292]

In the midst of this ongoing investment into fixed broadband, Australia has not climbed significantly in broadband penetration rankings and in fact, dropped slightly in global rankings due to faster growth in other countries.[293] In 2013, roughly 26 percent of the population had access to fixed broadband internet – the NBN goal is to connect 93 percent of Australians by 2020.[294]

3.4.4 New networks, same problems

Despite these ambitious broadband plans in both Australia and New Zealand, there appears to be little evidence of significant improvement in either's broadband speed, access or affordability rankings which remain near the OECD average despite leading in per-capita investment.[295] The lions share of broadband subscriptions in both countries continue to be DSL connections and both continue to have higher dial-up subscribership (around 10%) than other OECD countries (where the average is less than 3%.)[296]

It may be too soon to know the ultimate effects of these long-term plans if they are allowed to continue. Models in the EU and elsewhere of unbundling appear to be encouraging, particularly in creating competition among service providers. However, as Winseck noted in regards to New Zealand, it appears that fast networks alone are no

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[292] Turner, "Net Neutrality - a Debate We Can't Afford to Ignore."
[293] Taylor, "Australia Drops in OECD Broadband Rankings."
[294] Ibid.
[295] OECD, *OECD Communications Outlook 2013*; ITU, *The State of Broadband 2013: Universalizing Broadband*.
[296] OECD, *OECD Communications Outlook 2013*, 99.

substitute for neutrality, particularly when burdensome data caps and existing content / ISP relationships potentially skew user adoption.[297]

These examples call into question the claims by network owners in the US that non-neutral practices may be necessary to fund network expansion. Even as Australia and New Zealand fund and build new infrastructure, ISPs have continued to implement data caps and discriminatory policies. As these networks are completed and expanded and access to ultra-fast fiber networks and increased bandwidth becomes available, it remains possible that commercial or public interest in network neutrality will emerge.

As slower DSL and dial-up are traded for fiber to the node or premises technologies, competing ISPs in Australia and New Zealand may feel pressure either from consumers or policymakers to offer more open, non-discriminatory service. In April 2014, at least one small Australian ISP began offering unlimited bandwidth as part of its fiber connection to the NBN system.[298] Until these practices are more widely adopted, if ISPs are not willing to implement neutral practices despite the growing presence of ultra-fast fiber networks and heavily subsidized infrastructure, policies that promote open, equal access to web content should be adopted instead.

3.5 Mixed signals: architecture as problem and solution

The FCC's network neutrality rulings have generally avoided technical NN rulings in favor of guiding principles and best practices for internet service providers. In part, this is because the structure and protocols of the web are often fast-changing

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[297] Winseck, "New Zealand's Ultra-Fast Broadband Plan."
[298] Reilly, "TPG Brings Unlimited Data to NBN Users with New Plans."

and the FCC has generally acted reactively, rather than proactively. Most recently, this slow movement can be seen in the growing attention to internet interconnection and peering agreements. While some argue these agreements should not be linked to the classical understanding of NN as regarding the last mile user service, the effects of these agreements may have a significant role in the issue's outcome.[299]

The FCC and regulators elsewhere in the world have generally shied away from architecture and technology-specific internet regulation. Instead, they have relied on policies emphasizing "openness" and "transparency" from network owners.[300] For example, the Body for European Regulators of Electronic Communications (BEREC) has passed and encouraged policies focused on economic relationships rather than technology specifics by requiring greater network transparency and reinforcing the unbundling of network owners from ISPs.[301]

Similarly, rather than technology or network-specific rules, the FCC's policies have largely been based on transparency, vague terms regarding non-discrimination and openness. One the one hand, this can be seen as a move toward principle-based, rather than rule-based regulation. NN opponents often argue specific rule-based regulation of internet infrastructure would hamper future development and innovation.[302] However, unclear regulations regarding network architecture have left a

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[299] Feld, "Of CDNs, Netflix, Net Neutrality, and Cable Fu#$@!ery."
[300] Marsden, "Network Neutrality."
[301] Marcus et al., "Network Neutrality"; Internet Society, *Comments on Draft Guidelines on Net Neutrality for the Body of European Regulators for Electronic Communications*; BEREC, *BEREC Publishes Net Neutrality Findings and New Guidance for Consultation*.
[302] Thierer, "Are Dumb Pipe Mandates Smart Public Policy - Vertical Integration, Net Neutrality, and the Network Layers Model"; Yoo, "Innovations in the Internet's Architecture

great deal of flexibility to ISPs and increase the potential for rule-bending and abuse in the name of QoS.

Political choices, economic opportunism, geography, technological innovation and sometimes chance have shaped the architecture used today. It has brought together legacy infrastructure from previous technologies with new innovations of content, programming and computing. As such, the conscious architecture choices moving forward should ideally reflect a reconciliation of the needs and desires of both the network managers and the public who uses and benefits from its existence and efficiency.

While e2e networking is far from dead, the power of network owners as arbiters of limited bandwidth space puts them in a particularly strong position for steering the existing protocols by which the web operates and the physical infrastructure through which it travels. In the US, this is exacerbated by the control of a handful of centralized DSL and Cable ISPs creating a bottleneck for users who are particularly susceptible to coercion, manipulation or abuse. Because of their size, it appears incumbent ISPs have little or no incentive to invest in infrastructure – some have argued this will only increase if regulators allow ISPs to increase revenue by content charges such as the FCC's proposed "fast lanes."[303] As the largest ISPs increasingly integrate vertically with

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That Challenge the Status Quo"; Yoo, "Is There a Role for Common Carriage in an Internet-Based World?".

[303] Wyatt, "In Policy Shift, F.C.C. Will Allow A Web Fast Lane"; Cheng, Bandyopadhyay, and Hong Guo, "The Debate on Net Neutrality," 74–75.

content offerings becoming available online, the danger of discrimination toward competing content will intensify.[304]

But the lessons gathered from the cases of Australia and New Zealand suggest that network neutrality does not naturally evolve from architecture, but is instead consciously coded and preserved. Although the growth of FTTP investment and construction by new entrants like independent municipalities and Google as well as incumbents like AT&T and Verizon may relieve some bandwidth scarcity concerns, demand for a fast, reliable web will only grow.[305] While more utilities, products and services are moving online, the rapid development of data compression technology to reduce congestion and buffering may further reduce the congestion of time-sensitive and data-heavy traffic, but that remains to be seen.[306]

As long as internet infrastructure is controlled by a relatively small handful of incredibly powerful gatekeepers, greater capacity should be seen as a substitute for neutrality policy. While architectural choices are powerful tools for regulating behavior online, the increasing complexity of global networks offers many opportunities for intervention. For that reason, other dimensions must be relied upon to help preserve and maintain network neutrality.

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[304] Grove and Baumann, "Complexity in the Telecommunications Industry," 41.
[305] Crawford, *Captive Audience*.
[306] Cringely, "Net Neutrality Is Dead, but It Probably Doesn't Matter."

4 NEUTRALITY AND MARKETS

This chapter examines two very different "market-friendly" approaches to neutrality regulation and their effects. In the US, direct policy has been traded policies designed to promote competition between platforms. The EU approach has favored promoting competition by allowing ISPs to operate across a single platform. Despite these efforts, there is little evidence that either approach has eliminated the need for neutrality regulation. Instead, they show the importance of neutrality policies for ensuring a more equitable competition in the internet ecosystem.

4.1 The promise of competition

While all four modalities have shaped network neutrality, none has received more attention than the role of markets in encouraging or discouraging online content discrimination. Terms like competition, monopoly, duopoly, unbundling, and vertical or horizontal integration have become commonplace in the discussion. During the early 2000s, network owners and ISPs seemed to align with network owners and ISPs against and content providers and software corporations in favor of NN. In 2014, those lines are less clear.

The most prominent anti-NN voices (including the majority of telecom operators themselves) argue: that network neutrality policies are unnecessary because they conflict with the free market competition among users, content providers and network providers and / or that existing competition is sufficient to prevent the dangers of non-net neutrality. Despite these claims, there is little reason to believe current fixed broadband competition is robust enough to prevent non-discriminatory content

distribution. This threat of discrimination will only increase as ISPs and networks increasingly become content providers as well.

Some in the United States have suggested regulators look to European Union ways to create more broadband competition. Despite EU unbundling policies encouraging greater market competition, reports of network discrimination and throttling continue.

4.1.1 Changing markets

As mentioned in previous chapters, the convergence of legacy information technologies onto a single internet platform and network has driven the network neutrality conversation.[307] While this convergence is the result of new technological capabilities and capacity, it also marks a seismic shift in the information and communication technology and media markets. This has coincided with dramatic deregulation and integration where media organizations have taken advantage of less strict regulations and lowered cross-ownership barriers.[308] While new technology companies have emerged during this period of rapid convergence and growth, many of the largest and most influential network owners and content distributers have their roots in older media like radio, television, and film.[309]

The beginnings of internet deregulation were spurred in part by the growth of privately-owned cable distribution networks (upon which some of today's last-mile internet communications travel) as well as political and economic trends toward

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[307] Crowcroft, "Net Neutrality," 50.
[308] Holt, *Empires of Entertainment*.
[309] Wu, *The Master Switch: The Rise and Fall of Information Empires*.

deregulation of communication industries in the US beginning in the 1980s.[310] This culminated in the Communications act of 1996, which dramatically loosened the requirements on media and communications corporations.[311] As the telecommunications and media industry has grown, so has their influence on policymaking and regulatory oversight, giving the industry powerful influence over the very regulators charged to oversee it.[312] Today, telecommunications corporations are some of the largest campaign donors in the US and have spent significant funds lobbying against the implementation of any new network neutrality policies.[313]

Network neutrality opponents argue that the dangers expressed by neutrality advocates have yet to materialize, and the instances which have come to light (for example, Comcast's 2005 throttling of P2P users) are small exceptions, rather than an indicator of widespread ISP tactics. Both Yoo and Epstein argue ISP content discrimination practices should be investigated on a case-by-case basis, letting market forces and consumer demand control factors like pricing, bandwidth and competition.[314] The largest telecom opponents (Verizon, AT&T, and Comcast) have all opposed broad

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[310] Ibid., 608.
[311] Holt, *Empires of Entertainment*, 177; Wu, *The Master Switch: The Rise and Fall of Information Empires*.
[312] Wu, *The Master Switch: The Rise and Fall of Information Empires*, 549; Castells, *Communication Power*, 99; Croteau and Hoynes, *The Business of Media*, 245.
[313] Drutman and Furnas, "How Telecoms and Cable Have Dominated Net Neutrality Lobbying."
[314] Yoo, "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management"; Epstein, "What Broadcast Licenses Tell Us about Net Neutrality: Cosmopolitan Broadcasting Corporation v. FCC."

calls by the FCC and others for restraint regarding network management, arguing these rules would be ineffective and potentially harmful to their business practices.[315]

Not surprisingly, network owners and ISPs have stood in opposition to moves toward explicit net neutrality policies, citing proposed regulations as burdensome and potentially harmful to the Internet market. AT&T has warned network neutrality legislation may potentially reduce competition, compromise efficiency and prohibit operators from delivering performance-enhancing services.[316] Furthermore, in the company's 2013 annual report, AT&T claims the removal of the FCC's 2010 Open Internet Order would offer new flexibility in managing its networks.[317]

4.1.2 Making change under pressure

As the FCC currently revising its policies on the matter, the agency is left with few options and it appears the US internet market is now farther, not closer to network neutrality policy. While the ruling left the agency authority to regulate, a decade of legal failures has left few options. One remaining option would be to reclassify internet traffic under existing "common carrier rules." The telecom industry generally opposes any future FCC reclassification efforts that would include utility-style requirements designed for non-competitive industries. The National Telecommunications and Cable Association, one of the largest telecom lobbying organizations, argues network neutrality would "invariably stifle these investments by inserting the federal

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[315] Carp, Kulkarni, and Schmidt, "Transparency, Consumers, and the Pursuit of an Open Internet: A Critical Appraisal," 57.
[316] AT&T, "AT&T REsponse to the European Commission Questionnaire for an EU Strategy for International Cooperation on ICT."
[317] AT&T, *2013 Annual Report*.

government into the operation of broadband networks and the provision of broadband services."[318] In a May 2014 testimony before the US House of Representatives, FCC Chair Tom Wheeler faced questions regarding the agency's ability to balance the internet's market forces with potential regulation moving forward like reclassification.[319] Both during the hearing and in a submitted testimony, Wheeler stated the agency would review all available options for establishing open internet rules, while not ruling out reclassification measures.[320] Moving forward, Wheeler and the FCC are in the uncomfortable position of crafting rules for all involved parties with few options remaining.

The ongoing neutrality debate has involved the competing interests of major online influences including network owners, content producers and the larger online public. After years of debate there is a need for reconciliation that offers benefits to all involved in the internet ecosystem.[321] However, as the stakes and profits of the internet economy grow exponentially, the network neutrality debate has become a fight between the titans of old and new media for control of the web.

4.2 Power over pipes

The internet market in the US (if it can even be described as such) encompasses a variety of corporations and organizations ranging from those with legacies extending back over 100 years, to others in their infancy. The existing market conditions have

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[318] NCTA, "Why It's a Good Thing That Broadband Isn't a Common Carrier"; NCTA, "Our Opinion on 'The Opinion'"; NCTA, "What's at Stake When the Open Internet Goes on Trial?".
[319] Snider, "FCC Chairman Grilled at House Subcommittee Hearing."
[320] Ibid.; Wheeler, *Statement of FCC Chairman Tom Wheeler House Oversight Hearing Testimony*.
[321] Eli M. Noam, "Regulation 3.0 for Telecom 3.0," 8–9.

resulted in ISPs standing increasingly as gatekeepers to the online world. This uneven playing field makes NN regulations vital for the future of the web. From a markets perspective, NN can be seen as a corporate power struggle between established, incumbent network owners and ISPs like AT&T, Comcast and Verizon with long-established influence and increasingly powerful and popular content and application companies like Google, Facebook, and Netflix.[322] However, as these large corporations increasingly integrate both horizontally and vertically, the line between these groups and the trajectory of the network neutrality debate will continue to shift.

4.2.1 Gatekeepers to the web

The US market positions of ISPs and their respective networks are largely a product of their non-internet origins and a pattern of media deregulation over the last 30 years. The result is a market dominated by a handful of the largest DSL and Cable providers with marginal competition from smaller providers. An ongoing series of mergers and acquisitions has increasingly narrowed the number of ISPs available – these include the acquisition of TCI's cable distribution systems by Comcast and the steady re-unification of the "baby bells" which were separated in the 1980s break-up of AT&T's telephone monopoly.[323] Because of these acquisitions as well as the presence of usually just one telephone and cable provider for most cities, the majority of Americans have few options for broadband service providers – raising the possibility of market manipulation.[324] The size and influence of these ISPs has played a particularly

[322] Gladsone, "Net Neutrality and You."
[323] Crawford, *Captive Audience*, 76; Holt, *Empires of Entertainment*, 166.
[324] Croteau and Hoynes, *The Business of Media*, 149.

significant role in their ability to negotiate content agreements in cable, and increasingly are used to leverage power online as well.[325]

The economic considerations of ISPs are complex. They operate as the intermediaries of a two-sided market in which they negotiate with other networks (and large content providers) as well as end-users.[326] The product they provide – broadband connections – rely not only on the existing infrastructure, but the ongoing traffic that travels across it. These organizations argue that in order to keep up with increasing demand and network expansion they need a variety of tools to both recoup these costs. This means potentially charging customers and CSPs differently based on how they use the networks.[327] But regulators, network operators and civil society groups have found little common ground on what amount of pricing and content discrimination should be considered reasonable for network management.[328]

The NN conversation has largely focused on the extent to which ISPs should be allowed to manage or block traffic across the "last mile" of their networks. Given a lack of service provider competition for US users, ISPs are increasingly the singular intermediary (and potential gatekeeper) between users and content providers. This holds potential for abuse.[329] Some argue heavy use by a small number of users should be penalized, since it burdens the network for others, though this has largely been

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[325] Ibid., 152; Crawford, *Captive Audience*, 141–156.
[326] Lee and Wu, "Subsidizing Creativity through Network Design," 65.
[327] Yoo, "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management," 73–75.
[328] Frischmann and Van Schewick, "Network Neutrality and the Economics of an Information Superhighway."
[329] Clark, "[Special Section on Net Neutrality] Network Neutrality," 706.

addressed through tiered speeds, and limited use of data caps.[330] To discourage the heaviest users, ISPs, including AT&T and Comcast, have incrementally instituted data caps, which they claim affect only a small percentage of users.[331] The FCC's 2010 Open Internet Order did not prohibit these measures or speed tiers and usage-based pricing, however it did prohibit paid prioritization of content.[332] Paid prioritization would mean content providers or applications (or the ISP itself) could pay ISPs to reach customers faster or more reliably or potentially degrading the quality of other non-paying traffic.

Neutrality opponents and ISPs argue policies like the 2010 Open Internet Order (and other neutrality measures) are impractical barriers to future internet business models.[333] They say networks and service providers should be allowed to test new market approaches, pricing models, and network management initiatives, which neutrality rules prohibit.[334] In the wake the 2014 Verizon ruling it is unclear to what extent any FCC rule revisions will continue to prevent ISPs from creating new forms of pricing. Until more strict policies are legislated or more drastic neutrality regulations (such as reclassifying internet service to be under common carrier rules) it is likely network owners and ISPs will continue to pursue these strategies. Early internet service was largely held to the same common carrier standards in place for telephone communications, but in the early 2000s the FCC under the Chairman Michael Powell

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330 Yoo, "Innovations in the Internet's Architecture That Challenge the Status Quo," 95; Croteau and Hoynes, *The Business of Media*, 242–243.
331 Tussey and Sanson, "Infrastructure Disputes Shape Future of Streaming Media."
332 Genachowski, "Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity"; Comast Corporation, *Comcast 2013 Annual Report*.
333 Zelnick, *The Illusion of Net Neutrality*, 168.
334 Yoo, "Is There a Role for Common Carriage in an Internet-Based World?"; Zelnick, *The Illusion of Net Neutrality*, 169.

ruled that the networks had common with private cable networks than the telecommunications networks of the past and thus were not afforded common carriage protection.[335]

In light of enormous profit margins of the internet service divisions of ISPs and network owners, that these calls for pricing and discrimination flexibility have less to do with network investment, and more to do with growing their profit margins.[336] In fact, the reported revenue of the four largest US broadband providers (AT&T, Verizon, Comcast and Time Warner Cable) have increased while their spending on capital expenditures like network upgrades has largely remained steady (see Figure 3.) – all while the number of broadband users has increased.[337]

In other words, broadband providers are making more money and serving more customers without spending more on networks. While networks claim the network neutrality rules discourage investment, the reduction in capital expenditures from these providers began long before the 2010 Open Internet Order and has not seen a marked reduction since the rules were instituted.[338]

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[335] Noam, "Beyond Net Neutrality," 57.
[336] Crawford, *Captive Audience*; Reed, "Cable Companies' 'Comically Profitable' Margins Said to Provide Little Incentive to Invest in Fiber."
[337] Fung, "ISPs Are Spending Less on Their Networks as They Make More Money off Them"; Crawford and Shapiro, "Capex&Revenue_2001-2013 - Google Sheets."
[338] Crawford and Shapiro, "Capex&Revenue_2001-2013 - Google Sheets."

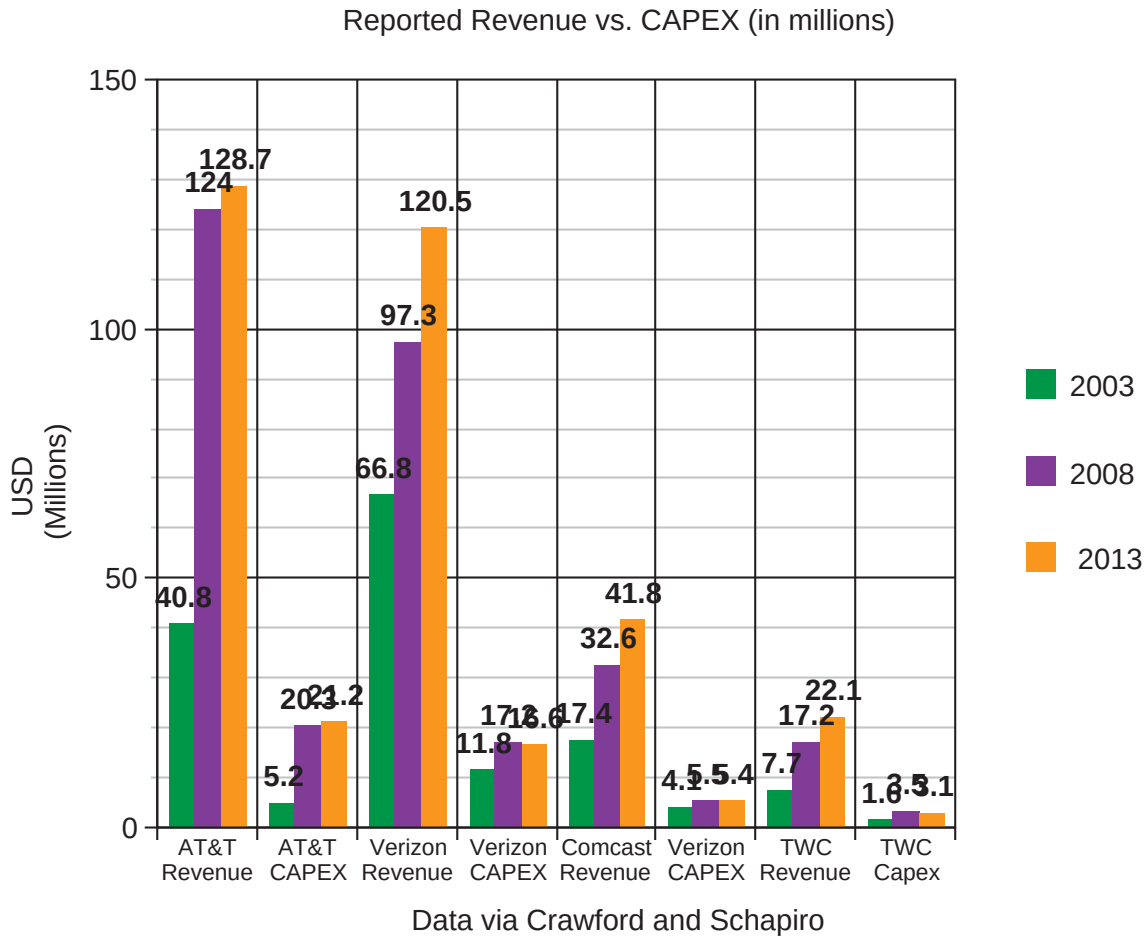

Figure 4.1 Five-year intervals of broadband revenue and capital investment (Data source: Crawford and Shapiro, "Capex&Revenue_2001-2013 - Google Sheets")

Feld argues processes like broadband pricing tiers and "premium service" add little value to the network itself while users pay ISPs higher prices or risk slower access.[339] With ISP average revenue per user margins dwarfing those of CSPs (In 2013, Google profited $11 per user, while Comcast made $323), it makes little sense for content companies to subsidize infrastructure construction and in fact, ISPs would be incredibly averse to slowing any content if markets were reasonably competitive.[340] The

[339] Feld, "An Examination of the Economics of Whitacre Tiering."
[340] Felton, "An Attempt at Clarifying the Net Neutrality Debate."

corporations who own increasingly large swaths of internet infrastructure may have great incentives to take advantage of their powerful position. Wu notes: "it doesn't take a genius to realize that if AT&T and the cable companies exercised broad discretion to speed up the business of some firms and slow down that of others, they would gain the power of life and death over the Internet."[341] Network neutrality is a necessary tool for fighting the outsized market power of US network providers. That need for neutrality is particularly clear when examining how ISPs have used their position when dealing with online content providers.

4.3 Content held captive

In the past 20 years there has also been an explosion of content and applications needing more bandwidth and faster download and upload speeds across the network. Simple landing pages with a minimum number of images have been replaced by streaming video, streaming audio, complex interactive applications and online ecosystems that demand greater resources and nearly instantaneous transmission to function.[342] This shift has led to a change in behavior online from users visiting a large number of unique webpages to the majority of web traffic passing through a handful of the most popular search engines, entertainment sites, and social networks.[343] This growing and influential segment of the internet market relies on fast, ubiquitous broadband connections to exist and until recently content providers have taken a substantial role in promoting network neutrality.

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[341] Wu, *The Master Switch: The Rise and Fall of Information Empires,* 551.
[342] Anderson and Wolff, "The Web Is Dead. Long Live the Internet."
[343] Ibid.

Content providers online range dramatically in scale from the individual owner of small, seldom-visited website to multi-billion dollar online media corporations like Amazon, Google, Facebook, Microsoft, Netflix, and Apple. The actual content provided is as often as diverse as the web itself. Whether professionally produced or user created, a large portion of today's internet content requires speedy, seamless broadband connectivity.[344] In July 2014, a list of the most popular websites globally were dominated by search engines (led by Google), social networks (led by Facebook) and video streaming websites (led by YouTube.)[345]

While these website and applications are popular, they rely on broadband networks to access users, content, and revenue. The institution of neutrality policies by the FCC are in part a response to anti-competitive actions by ISPs who have exploited their role in the internet market to help or hurt content online. The sheer scale of internet providers that have been allowed to merge and grow in the de-regulated US media market has intensified this. In particular, network providers have focused on three types of internet traffic: peer-to-peer file sharing, Voice over IP (VoIP), and video streaming.[346]

While a wide variety of internet content is available legally, like YouTube, Netflix, Spotify and Hulu, the decentralized and unlimited duplication of media online has undermined a previously significant source of revenue for media companies. This

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[344] Lee and Kim, "The Effects of Network Neutrality on the Diffusion of New Internet Application Services."
[345] "Alexa Top 500 Global Sites."
[346] Lee and Kim, "The Effects of Network Neutrality on the Diffusion of New Internet Application Services," 386.

has drawn the attention of the media companies and regulators.[347] A community of online users illegally sharing digital versions of these media through a variety of simple, largely-anonymous tools including peer-to-peer sharing, linking websites and cyber lockers.[348] This has drawn the attention of both media corporations and regulators. In 2005, Comcast was fined by the FCC for repeatedly slowing the traffic of peer-to-peer users on the suspicion that those users were illegally sharing files – a clear violation of network neutrality principles.[349] In addition to ISPs have also taken actions to discriminate against online content that competes with legacy technologies.

VoIP offers a similar service to audio telephone communication, but uses IP protocols to translate and transmit these voice messages over the internet rather than a separate network. These services require faster, more reliable service than websites, and are thus also more sensitive to traffic management by ISPs.[350] Because many DSL and cable broadband providers also offer voice services, there is an incentive for them to slow or block competing VoIP services to their customers.[351] However, VoIP also creates competition new with the existing phone serve many network providers already offer. In 2004, the FCC opened an investigation against Madison River Communications that blocked Vonage's VoIP service to its customers.[352] Madison River argued it blocked the sites based on network management needs, however the presence of a competing

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[347] Lobato, *Shadow Economies of Cinema*, 105–108.
[348] Ibid., 95–100.
[349] Marsden, "Network Neutrality."
[350] Clark, "[Special Section on Net Neutrality] Network Neutrality," 706.
[351] Crawford, *Captive Audience*.
[352] Marsden, *Net Neutrality*, 34–35.

service being sold by the company appeared to show a conflict of interest.[353] After some investigation, Madison River agreed to stop blocking VoIP services and offered a voluntary payment in exchange for the case being dropped.[354]

While the FCC has made high-profile investigations of blocking against VoIP providers, in many other places in the world slowing and blocking of these services is not uncommon, though regulators usually argue this based on network strain, rather than market competition. For example, as recently as 2009 South Korea restricted VoIP services except those offered by the preferred South Korean carrier.[355] The Netherlands, one of the first countries to codify strong, formal network neutrality laws, considers VoIP and some streaming video differently from less data-intensive Internet traffic.[356]

Video traffic is also regarded differently from other web services, though the threat of video content discrimination is increasingly seen as a market competition, rather than a technical matter. In part, this is the result of the slow shift of video services from traditional television technologies like over-the-air and cable to streaming online. As the technological capacity for streaming video has improved, so have video content producers increasingly shifted content online.[357] Recently, media institutions from around the world have scrambled to capture the interest and eyes of online viewers.[358] These include traditional media producers and television studios as well as new tech

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353 Zelnick, *The Illusion of Net Neutrality*, 180–181.
354 Ibid., 181.
355 Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks," 101.
356 van Beijnum, "Netherlands Becomes World's Second 'Net Neutrality' Country."
357 Thomas, "When Digital Was New: The Advanced Television Technologies of the 1970s and the Control of Content."
358 Cunningham and Silver, *Screen Distribution*.

companies seeking to compete with these legacy producers for the new online territory.[359] While this video programming exists on the new internet platform, the tools for financing these endeavors uses many of the same strategies as previous forms of media including relying on: single purchases, (iTunes and Amazon), advertising (YouTube), subscriptions (Netflix and Amazon Prime), or a combination of the three (Hulu.)[360]

The rise of "cord cutters" (consumers replacing cable television service with online video streaming) has raised the interest of cable providers. In response to this, vertically integrated ISPs who also provide cable video services, have a strong incentive to block or slow competing video traffic or offer faster select content as part of their cable services.[361] However, network neutrality rules have generally stood in the way of this. In a 2014 interview, Former FCC chairman and current president of the National Cable and Telecommunications Association, Michael Powell denied this, arguing only a small percentage of consumers are technically "cord cutters."[362] Yet despite these claims, the rise of a handful of new competitors into the video market has drawn the attention of the cable industry and intensified the neutrality debate. Video providers like Comcast have invested heavily in streaming video services like the company's TV

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[359] Ibid.
[360] Lotz, *The Television Will Be Revolutionized*, 249–250.
[361] Crawford, "Response to Harold Furchtgott-Roth"; Thierer, "Are Dumb Pipe Mandates Smart Public Policy - Vertical Integration, Net Neutrality, and the Network Layers Model," 305.
[362] Powell, C-SPAN: The Communicators: Michael Powell.

Everywhere service that allows cable customers to stream television programming online as part of cable subscriptions.[363]

One online video service, Netflix, has been particularly vocal about the need for network neutrality to preserve online video streaming. Netflix, which originally provided subscription DVD rentals by mail before shifting to offering subscription online video streaming, has grown to being responsible for a large portion of peak internet traffic in the US.[364] In the wake of the 2014 *Verizon* decision, some speculated that cable companies and ISPs may take the opportunity to throttle Netflix content in exchange for payment or carriage agreements.[365] However, in Netflix's January 2014 letter to investors, the company argued its popularity with consumers would likely prevent any overt blocking or throttling.[366] This appeared to only be partially true.

4.3.1 Backdoor deals to defeat neutrality

With the 2014 NN debate and FCC rule revision in the background, Netflix participated in a number of high-profile negotiations and disputes with ISPs including Comcast and Verizon over interconnection agreements.[367] Ultimately, Netflix reached agreements with these ISPs; but it remains unclear to what degree the NN debate served as a bargaining chip for Netflix in the negotiations or whether the

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[363] Crawford, *Captive Audience*.
[364] Sandvine, *Global Internet Phenomena Report 1H 2014*.
[365] Lieberman, "Will Cable Ops Take On Netflix Following Court Upset Of Net Neutrality Rules?".
[366] Tummarello, "Net neutrality nightmare unlikely, Netflix says"; Netflix, "Letter to Investors."
[367] Brodkin, "Why Verizon Won't Solve Its Netflix Problem as Soon as Comcast"; Ramachandran, "Netflix to Pay Comcast to End Traffic Jam"; Lawler, "No, Netflix's Deal with Comcast Won't Destroy the Internet"; Bright, "Verizon Could Be Throttling Netflix and Amazon, but There's No Actual Evidence of It."

interconnection debate is a proxy war for the larger discussion about balancing CSP and ISP power. Following this public disagreement, the FCC has vowed to examine interconnection more closely, which may affect future neutrality regulation. Nonetheless, the debate raised scrutiny about the otherwise complex and under examined role of interconnection and peering in the internet debate and their implications on the larger internet market.[368]

Increasingly content agreements and interconnection deals are used by ISPs as a way to circumvent neutrality rules. Beginning in 2012, Comcast allowed the streaming of video through the company's Xfinity On Demand service over Xbox to not count against user data caps, while other services like Netflix and HBO Go continued to count.[369] Comcast has argued this discrimination is acceptable because its CDN agreement with Microsoft means this streaming is not happening over the internet (and subject to NN) but instead is merely an exchange between Comcast's own servers and its users.[370]

The largest CSPs may be able to afford to negotiate cable-like carriage fees with ISPs and network owners, small and mid-size companies would potentially be at a clear disadvantage.[371] For this reason, the largest companies may not be eager to enter the network neutrality debates. Crawford argues these major internet companies actually have strong leverage against internet providers – just as the most popular cable

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368 Fung, "The FCC Is Going to Scrutinize Netflix's Deals with Comcast, Verizon — and Others, Too."
369 Holt, "Regulating Connected Viewing: Media Pipelines and Cloud Policy," 27.
370 Ibid.
371 Wilson, "VC Pitches In A Year Or Two."

television channels (like ESPN) have strong leverage over cable companies.[372] She argues "Facebook and Google are powerful enough that the providers need them more than they need the cable guys. So they know they'll be able to make all the deals they want. They're not so worried about the fate of the next Google, or the next Facebook."[373]

As Google has grown, so has its role in the network neutrality debate. In 2005, Vinton Cerf, one of the developers of TCP / IP, a Google Vice president and the company's "Chief Internet Evangelist" testified to the US House of Representatives on the benefits of network neutrality and the merits of non-discrimination.[374] In 2006, he again argued on Google's behalf to congress that the openness of the internet has led to its success and growth. Yet in 2010, the company's position appeared to budge – it announced a policy proposal agreement with Verizon that recommended neutrality on existing platforms, but opened the potential for new pricing approaches to "new technologies."[375] While Google has signed a petition supporting FCC action in supporting network neutrality, the company has maintained a lower visibility in the 2014 debate than in previous years.[376] In part, this may be a result of Google's own increasing investment in internet infrastructure through Google Fiber and it's investment in the wireless Android smartphone market.[377]

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[372] Kafka, "What's Net Neutrality?".
[373] Ibid.
[374] Davidson, "Vint Cerf Speaks out on Net Neutrality."
[375] Cohn, "A Review of Verizon and Google's Net Neutrality Proposal | Electronic Frontier Foundation"; Kafka, "Google, Verizon Announce a Cake-Having, Eating 'Policy.' But It's Not a 'Business Arrangement.'"; Wyatt, "Google and Verizon Near Deal on Pay Tiers for Web."
[376] Staff and agencies, "Google, Facebook and Amazon Write to FCC Demanding True Net Neutrality"; Shields, "Google's Growing Silence on Saving Open Internet Leaves Fight to Startups."
[377] Shields, "Google's Growing Silence on Saving Open Internet Leaves Fight to Startups."

The combination of content and infrastructure is particularly salient both as a tool for maximizing distribution as well as controlling the possibility of losses through illegal file sharing and copyright infringement. Neutrality policies balance the power between ISPs and content providers by offering relatively equal footing for emerging companies who otherwise would have little leverage to gain access to networks.[378] Some have suggested that without neutrality rules, emerging online services like cloud storage and computing – which require nearly instantaneous access to servers over the web -- could become prohibitively expensive without some expectation of fair pricing and treatment.[379] While pricing freedom and content discrimination may offer network owners and operators profits and possibly revenue for network investment, Van Schewick argues the potential market damage to innovation and applications online would be costly to society.[380]

4.3.2 Size matters: vertical integration and neutrality

In many ways, the increasing vertical integration between ISPs and CSPs may be one of the gravest threats to the current status of network neutrality. As networks integrate internally-produced or owned content into their services, existing CSPs become direct competitors. The following is a hypothetical nightmare scenario for unrestricted vertical integration with no network neutrality: *"ISP X" is the sole cable ISP in a city and offers a streaming video service (ISP X Video) that competes with "CSP Z." Without some form of net neutrality expectation, ISP X could charge its customers an added fee*

[378] Samuels, "What's Next for Net Neutrality?: Don't Harm the Start-Up Economy."
[379] Froehlich, "Net Neutrality Retreat Threatens Cloud Growth."
[380] Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*, 390.

to access CSP Z while offering "ISP X Video" for free. Without ISP competition, users would have little or no access to CSP Z's content without paying more. ISP X could also potentially negotiate fees to make CSP Z's content available to ISP X users for free again. In this scenario, the ISP becomes the ultimate arbiter of what content its users can access and has an incentive to only offer the content that will bring in the most profits.

For now, it appears policies, rather than the market has discouraged the worst of these potential scenarios, but in the wake of the 2014 *Verizon* ruling, the potential for this level of ISP intervention remains far from impossible. But despite the potential for the largest ISPs and vertically-integrated media corporations to exploit their market position, these organizations have seen a mixed track record – the failed merger of AOL and Time Warner being a prime example. Grove and Baumann argue corporations attempting to integrate content and infrastructure have underperformed.[381] They argue this is partially because the business models and technical needs of each of these businesses are dramatically different – causing slow, and troubled integration processes, but potential for long-term success.[382] The investors and owners of these organizations are leery of expensive, long-term investments with unreliable payoff – they argue the threat of an internet dominated by vertically-integrated corporations (with some exceptions) remains generally remote.[383]

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[381] Grove and Baumann, "Complexity in the Telecommunications Industry," 41.
[382] Ibid.
[383] Ibid.

However, the 2011 union between Comcast and NBC Universal has already proved to be more successful than the AOL-Time Warner predecessor.[384] The newly-acquired content from NBC-Universal gave Comcast a powerful bargaining chips when negotiating with both television programming companies and distribution networks.[385] In other words, because of Comcast's vast cable infrastructure – it could negotiate favorable agreements with programming companies; because of its valuable programming (NBC and its affiliates) it could secure lower fees from competing cable providers.

In fact, it is this cable-style negotiating tactics that NN proponents fear.[386] Applied to the internet, cable-style negotiating would mean ISPs may charge CSPs carriage fees based on their popularity. Alternatively, ISPs may institute data caps, but allow some content providers to not count against these caps, provided they've negotiated an agreement with the ISPs – a practice increasingly common on non-neutral wireless networks.[387] While this may set a dangerous precedent on wireless networks, they are far more competitive than wireline broadband – where there is far less competition between ISPs.[388]

In 2014, Comcast offered to buy Time Warner Cable (the cable provider / ISP was spun-off from AOL Time Warner) and its millions of subscribers would potentially only

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[384] Crawford, *Captive Audience*.
[385] Ibid., 134–140.
[386] Lee and Wu, "Subsidizing Creativity through Network Design," 66; Wu, *The Master Switch: The Rise and Fall of Information Empires*, 551.
[387] Brodkin, "AT&T Plan to Turn Data Caps into More Cash Could Come to Home Internet"; Anderson, "Wireless Gets a Free Pass on Net Neutrality"; Ziegler, "T-Mobile's 'Music Freedom' Is a Great Feature — and a Huge Problem | The Verge."
[388] Noam, "Beyond Net Neutrality."

increase the company's power to negotiate with content providers (and users) - if not through non-neutral pricing, then through largely under-regulated interconnection, peering and CDN agreements.[389] Time will tell whether regulators allow the largest and second-largest cable broadband networks become a single super-provider. The merger would only further reduce the number of US broadband providers and perhaps more significantly increase Comcast's already immense market leverage against content providers. With the power imbalances between networks and content providers only become greater, network neutrality and non-discrimination rules in the US should be seen as preserving market competition rather than inhibiting it.

4.4 Neutrality in the European Union

Both the US and the EU have wrestled with appropriate tools for addressing online competition, yet the two have approached the issue very differently.[390] In part, this is because each have different histories, political / cultural climates and governance structures. Rather than passing explicit continent-wide network neutrality rules, European regulators have instead opted for a series of regulatory measures focused on promoting broadband transparency and competition rather than explicit policy prohibitions.

While European homes only have access to single fixed telecommunication network, competition access to infrastructure through local loop unbundling (LLU) has

[389] Higginbotham, "Broadband Shouldn't Be like Cable TV. Why Consumers Should Care about Peering." See also the architecture section of this document.
[390] Cave and Crocioni, "Does Europe Need Network Neutrality Rules?".

created opportunities for broadband competition.[391] In contrast, U.S. households often have internet access through both cable and telephone providers, but operate within a largely duopolistic market. Because of these differences, the reinforcement and maintenance of this unbundling has taken priority over more specific regulations on networks and ISPs.

4.4.1 Crafting neutrality through markets?

The European Commission, the executive and law-proposing body of the European Union, Internet regulations have attempted to balance defending public access rights, preserving European culture and promoting European content creators.[392] Beginning with a framework in 2002, EU legislators took steps were to promote non-discriminatory actions by ISPs and general Internet quality of service. Since then attempts have been made to balance increased QoS standards for applications without further burdening ISPs and also working with existing national regulatory policies.[393] The 2002 directive asked that member nations follow a series of steps to analyze current practices and encourage broadband providers in each step to take steps increasing competition and transparency based on each country's specific conditions.[394] The 2002 EU policy relied almost exclusively on market competition measures rather than explicitly network neutrality rules.[395]

In 2011, the European Commission reexamined the issues surrounding open

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391 Marcus et al., "Network Neutrality."
392 Marsden, *Net Neutrality*.
393 Ibid.
394 Carter et al., "A Comparison of Network Neutrality Approaches in."
395 Ibid., 21–22.

internet and Net Neutrality in further depth. The subsequent report emphasized the EU's need for "more stringent measures to achieve competition and the choice consumers deserve."[396] The Commission pledged to address strains on existing networks by working with EU member states and stakeholders to encourage the development of broadband to relieve bandwidth pressure.[397]

Much of the information informing the European Commission's policies on Internet access, traffic and speeds has been gathered by the Body of European Regulators for Electronic Communications (BEREC), a board composed of the heads of National Regulatory Authorities (NRAs) that monitor communication markets, services and networks.[398] Past recommendations on net neutrality from BEREC have drawn attention from organizations such as the Internet Society, which praised the board's October 2011 recommendations for clear definitions of Internet service, transparency in monitoring connection speeds, bandwidth, and access.[399]

A 2012 BEREC report indicating the status of Internet practices and restrictions in Europe showed nearly one in five EU broadband users was subject to some form of network neutrality violations.[400] In response, the organization suggested more competition should be the main tool for disciplining ISPs with user transparency a must

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396 European Commission, "The Open Internet and Net Neutrality in Europe. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions.," 9.
397 European Commission, "The Open Internet and Net Neutrality in Europe. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions."
398 BEREC, *BEREC Publishes Net Neutrality Findings and New Guidance for Consultation*.
399 Internet Society, *Comments on Draft Guidelines on Net Neutrality for the Body of European Regulators for Electronic Communications*.
400 BEREC, *A View of Traffic Management and Other Practices Resulting in Restrictions to the Open Internet in Europe*.

for maintaining fair competition.[401] That report also noted existing regulatory tools (like clear rules regarding acceptable QoS measures) should be adequate for addressing net neutrality concerns unresolved by market forces. Marcus, Nooren, Cave, and Carter recommend the EU maintain existing NN regulations which upheld existing QoS rules while monitoring for neutrality complaints, usually the throttling of p2p and VoIP users.[402] Despite these basic network neutrality framework and subsequent statements supporting neutrality in the region, the EU continues to defer to market self-regulation or jurisdiction of member country NRAs and legislation.

While unbundling is more common in the EU, the level of scrutiny placed on European telecom corporations depends on the whims of the European Commissioners and European Parliament, however in the wake of the 2014 US setbacks, neutrality proposals in Europe appear to be reinvigorated.[403] A more robust set of regulations in Europe called "ConnectedContinent" has been slowly introduced and moved through the EU governmental system.[404] After five years of development, the EU Parliament passed a version of the network neutrality bill in April 2014 after several rounds of debate which removed a provision for allowing "specialized services" and establishing stronger NN rules for both wireline and wireless networks including "a clear and binding definition of Net Neutrality and prohibitions against blocking, throttling and other forms of discrimination from Internet service providers."[405] Since then, the bill has

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401 BEREC, *BEREC Publishes Net Neutrality Findings and New Guidance for Consultation*.
402 Marcus et al., "Network Neutrality."
403 Marsden, "Net Neutrality in Europe."
404 Ibid.
405 Levy, "Big Net Neutrality Win in Europe."

faced much strong opposition from European telecommunications companies, members of the European Commission and member states and may be delayed until as late as 2016.[406]

4.4.2 Making rules for a diverse region

Attempts to manipulate markets to create a more neutral internet through unbundling have been somewhat effective, but structural measures elsewhere have also created similar results. For example, the equal distribution of high-speed cable and fiber optic Internet technology in South Korea appears to discourage content discrimination; in Germany, a market dominated by the single provider Deutsche Telekom, government attempts at decoupling have been attempted, but have largely been unsuccessful, leading to repeated attempts at creating alternate policies to ensure network neutrality compliance from the country.[407]

However, in the decade since the EU's light-handed competition and unbundling-based approach have been adopted, the overall effects of fostering a neutrality climate are unclear. Broadband adoption in the EU continues to grow, though that growth appears vary widely from country to country. Since 2004, fixed broadband penetration in the EU has grown from around 4% to nearly 25% yet only 5% of the population has access to fast-broadband (over 30 Mbps.) and many of those are located in a handful of countries.[408] The majority of EU broadband customers continue to

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406 Kirwin, "EU Member States Remain Divided Over Net Neutrality, Mobile Fees, Spectrum Policy."
407 Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks."
408 Communciations Committee, *Broadband Access in the EU: Situation at 1 July 2013*.

connect via DSL through copper phone lines, though in some places like Romania and Belgium over 50% of subscriptions are for ultra-high speed fiber connections.[409]

Despite competition and transparency rules, accusations of heavy-handed network management techniques by ISPs persist.[410] Because of this and a political movement to develop a clearer region-wide broadband development climate and policies, support has grown for more explicitly neutrality policies.[411] If passed, measures such as those proposed by the European Parliament in 2014 may more clearly align the various member state policies ranging from explicit rules to industry self-regulation.[412]

Member-state policies regarding neutrality range from the strong support like the Netherlands, to some echoing the official EU position, and five smaller members that had taken no clear position on the issue.[413] While many EU countries including France and Sweden have taken steps toward supporting network neutrality, in 2012 the Netherlands became the first European country to adopt its own formal laws banning the blocking or levying of additional fees for the use of Internet communication services by mobile telephone operators.[414] For some European countries, passing neutrality laws internally may be politically easier and faster than waiting for continent-wide regulations.

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[409] Ibid., 1.
[410] Jančařík and Jaramillo, "Net Neutrality in the EU."
[411] Schaake, "A Digital Future Needs Real Net Neutrality."
[412] European Commission, *Implementation of the EU Regulatory Framework for Electronic Communicaitons - 2014*.
[413] Marsden, "Network Neutrality"; Gross, "Study."
[414] O'brien, "Dutch Lawmakers Adopt Net Neutrality Law."

4.5 Different approaches, different results

In the most basic sense, the unbundling approach adopted in much of the EU is designed to foster market competition by offering multiple service providers to compete across a single infrastructure. In comparison, the US approach allows multiple different technologies to be constructed and compete with each other for users. In both approaches, policy is used to cultivate different market approaches.

The effects of the different approaches on the larger internet markets are unclear – each afford different benefits and consequences for both the US and EU. For example, since 2007 annual infrastructure spending per-household in the US is nearly double that of the EU, raising the possibility that the unbundling approach discourages investment.[415] However, the cost of high-speed internet service (30 Mbps+) is also generally lower in the EU than that of the US.[416] Not only that, but according to the ITU, nine of the top 10 countries with the highest broadband penetration are within the EU.[417]

The range of speeds, investment and fixed broadband technologies vary greatly between EU member nations and the EU average is not particularly informative for comparison.[418] The telecommunications markets in Europe countries (many of which have recently-deregulated national telecom monopolies) often resemble each other more than the US system.[419] While the effects of these two approaches can be compared,

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[415] Yoo, *U.S. vs. European Broadband Deployment: What Do the Data Say?*, 14.
[416] Ibid., 20.
[417] ITU, *The State of Broadband 2013: Universalizing Broadband*, 43.
[418] Communciations Committee, *Broadband Access in the EU: Situation at 1 July 2013*.
[419] Wallsten and Hausladen, "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks."

there are some limitations to what they tell us. In part, this is because the multi-state composition of the EU offers a huge range of business climates and populations compared to the US.

While ISP competition may be viable in many European countries where a centralized infrastructure allows for easier service unbundling, the size and influence of telecommunications corporations, the wide variety of different infrastructures, and the lack of interest by regulators and legislators in major overhauls means the chances of similar unbundling in the US is unlikely.

4.5.1 The dream of a market solution

The economic implications of network neutrality have made it a popular subject for analysis, but much of the impact relies on speculation and projections about the impact of future neutrality regulations. Generally, some flexibility for pricing, network management, caps and tiered service are accepted in the internet economy; however more dramatic requirements on pricing, content discrimination or the reclassification of internet communication as common carriers may lead to unexpected results.[420]

Although they argue their role is maintaining competition between companies online, US regulators like the FCC, FTC, and Justice department have recently avoided dramatic interventions.[421] Under the banner of competition and openness, the FCC policy has nominally supported the issue with a handful of "open internet" orders, but offered relatively few consequences if they were violated.[422] Recently, the FCC's most

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[420] Hahn and Wallsten, "The Economics of Net Neutrality," 2, 5.
[421] Federal Communications Commission, *Eighth Broadband Progress Report*.
[422] Marsden, *Net Neutrality*.

powerful tool for maintaining NN has been through its oversight role over the mergers of media companies.[423] As an arbiter of the "public interest," the commission has secured temporary non-discrimination agreements as stipulations for several corporate mergers including AT&T. A three-year commitment to preserving network neutrality on AT&T's networks was one of the final conditions required by the FCC before the company's merger with former "baby bell" Bellsouth.[424] Likewise, Comcast's merger with NBC-Universal was approved pending a multi-year neutrality commitment.[425] Recently, two announced mega-mergers between Comcast-Time Warner Cable and AT&T-DirectTV – if approved, are expected to include ongoing network neutrality and transparency requirements.[426]

As the FCC reassesses its approach to the issue following the 2014 Verizon ruling, the European approach to fostering neutrality through market competition offers key lessons for US policy moving forward. In particular, the movement to create more explicit network neutrality policies in Europe, despite existing transparency and competition measures may be a sign of the limitations of market-based competition to reach an ideal level of non-discrimination protection.

Comparisons between the US and EU have not been uncommon. Notably, during the last FCC net neutrality rulemaking process, a series of academics published an op-ed in *The New York Times* suggesting regulators mirror the EU approach of

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[423] Marsden, "Network Neutrality," 98.
[424] Reardon, "FCC Approves AT&T-BellSouth Merger."
[425] Crawford, *Captive Audience*, 219–220.
[426] AT&T, "AT&T to Acquire DIRECTV"; Mitchell, "Comcast-TWC Merger Might Help the Cause of Net Neutrality - Fortune."

increased transparency. They claimed:

> Before the commission embraces regulation, it should take another look at the European model and focus on a policy built on transparency. […]Under the new European rules, providers are required to inform customers of any limitations that they impose on access, or on the use of services and applications, including bandwidth caps. […]This represents a vote of deserved confidence regarding the effectiveness of Europe's current competition policy as well as the evolution of pricing, competition and investment in the industry. Europe already has all the tools needed to address lapses in competition if they occur.[427]

Similar calls for transparency are in many ways the most market-friendly and politically-feasible approaches for addressing content discrimination by ISPs, but as the EU shows, they have had limited success and may be abused.[428] They often rest on the theory that a more transparent, informed marketplace will more informed and efficient decisions, but this becomes complicated as the limitations of visibility (regarding sometimes incredibly technical information) and provides few solutions in markets with little or no competition.[429] Complex interconnection and peering agreements are playing an increasingly significant role in how online content flows, and while they have not traditionally been a part of network neutrality regulations, increased transparency in regards to how these agreements are brokered and executed could potentially preempt the need for *ex post* regulation.

Neutrality advocates have called for greater transparency requirements, particularly for those demanding greater details regarding ISP interactions and interconnections. While the transparency aspects of the FCC's Open Internet Order

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[427] Mayo et al., "How to Regulate the Internet Tap."
[428] Carp, Kulkarni, and Schmidt, "Transparency, Consumers, and the Pursuit of an Open Internet: A Critical Appraisal," 60.
[429] Ibid., 60, 62–63.

were not dismissed in the *Verizon* ruling, the information reported to the commission is fairly limited and could be expanded to include more detailed reporting on interconnection agreements, ongoing speeds reports, and more detailed reporting on the speeds customers encounter.[430]

4.5.2 When markets don't lead

While US network operators hold particularly strong positions and near-monopoly power, they still compete to some degree with both traditional and emerging technologies. Their influence will only increase without some form of network neutrality policy to enforce equitable market relationships online. However, the tenuous balance between online content providers and network owners is threatened as the largest CSPs also have the ability to protect themselves from future competition by working with those who provide the pipes.

There appears to be little momentum in the US towards Euro-style unbundling that would allow ISPs open access to compete for access to users. Instead, entrenched network owner / operators operate with little or no competition and little incentive to invest in faster infrastructure, despite huge profits. In a climate of little or no broadband competition, network neutrality rules attempt to establish some level of reasonable competition by competition by limiting the ability for ISPs to exploit their market position through content and price discrimination. While the FCC's 2010 attempt to maintain competition through neutrality has been dismissed, the *Verizon* ruling did

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[430] Gillula and Glaser, "Net Neutrality Will Require Us to Shine the Light on Internet Providers."

leave the possibility of drastic regulatory action: reclassification of internet service as a utility.[431]

[431] Silberman, Wilson Rogers, and Tatel, Verizon Communications Inc. v. Federal Communications Commission (2014) (United States Court of Appeals for the District of Columbis Circuit 2014).

5 NEUTRALITY AND NORMS

The following chapter discusses the normative aspects of network neutrality. In particular, the following three cases show how community consensus or lack thereof may prevent the wider adoption of neutrality norms. First, it examines how the long legacy of common carriage has influenced network neutrality norms even beyond the removal of common carriage rules from internet service. Next, the chapter highlights the emergence and resonance of the values of openness and independence associated with the internet and how divisions between those values may affect the adoption of neutrality norms to a wider community online. Finally, it highlights how divisions within international governance meetings and the proposal and supporting of network neutral or non-neutral principles reveal the challenges facing the potential adoption of wider network neutrality norms.

5.1 The end of the internet?

The provocative headline "We're About to Lose Net Neutrality — And the Internet as We Know It," in the magazine *Wired* claimed a 2013 challenge to the FCC's 2010 Open Internet Order would end content non-discrimination online in the US and by extension, drastically alter the internet.[432] Only a few months later, the 2014 *Verizon* case was decided and key parts of the order were struck down. Even though the FCC's regulatory protection against content discrimination has been removed, the expectations by many of how content should be available online remains.

[432] Ammori, "We're About to Lose Net Neutrality — And the Internet as We Know It."

Network neutrality is tied to a blend of "technical, economic and civic meanings."[433] For some, the subject represents the threat of heavy-handed government regulation, while for others it is the path for cultivating a more open, democratic web. While norms supporting network neutrality may have helped shape current policy and markets, but without unified support from the larger public, those norms have proved no match compared to other forms of regulation.

5.1.1 Why haven't norms saved the net?

Lessig argues norms established through subjective and objective terminology, shapes the social understanding of an issue and how it is and will be regulated.[434] He notes, "Norms constrain an individual's behavior, but not through the centralized enforcement of a state. If they constrain, they constrain because of the enforcement of a community. In the case of the internet, that community could potentially include billions.

The decentralized and open nature of the internet makes identifying its underlying norms difficult if not impossible to identify. Instead, the internet is comprised of many networks and communities with many varying expectations and norms. Identifying the norms of network neutrality are also challenging, though many can be traced to the concept's roots in common carriage. Despite the fact that much of discussion and advocacy surrounding network neutrality is driven by emotionality and

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[433] Kimball, "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality.'"
[434] "The New Chicago School."

appeals to these normative values, much of the academic analysis has focused on its legal and policy measures or the market interactions between ISPs and CSPs.[435]

Unlike the mechanisms of other modalities, norms rely on community for enforcement. As this chapter shows, the fragmented nature of the internet as a community has repeatedly been no match for more concentrated regulatory powers of markets, policies and architecture. In each of the following three cases, norms have played a significant role in the expectations and shaping of the network neutrality conversation, but have also failed to translate normative support to continuous behavior.

In the case of common carriage, ancient norms of transportation and public use were removed from internet connections during a powerful trend of media concentration and deregulation. But despite this change, the common carriage norms underlying network neutrality have played a role in how NN continues to be addressed. Likewise, divided community norms of internet independence and openness have led to fragmented approaches to how those values should be preserved, thus weakening support for network neutrality policies. Finally, while international internet governance organizations have worked to assemble and establish norms of internet freedom and openness, these organizations have failed to establish or support explicit neutrality standards. In all three cases, community divisions have stood in the way of neutrality norms, thus allowing great influence from the other regulatory dimensions.

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[435] Krämer, Wiewiorra, and Weinhardt, "Net Neutrality."

5.2 Common carriage as a norm

While the term NN is a relatively new term, it follows a legacy of underlying principles supporting fair and open access to communication networks as well as content-neutral delivery of information with a history extending far into the past.[436] Common carriage has changed significantly over time. Noam argues that while common carriage is deeply associated with utilities and monopolies, it is not inherently linked to those concepts:

> Precursors to common carriage go back to the Roman Empire and the legal obligations of shipowners, innkeepers and stable keepers.4 In England early common law placed certain duties on businesses which were considered 'public callings'. Common or public occupations included those of bakers, brewers, cab drivers, ferrymen, innkeepers, millers, smiths, surgeons, tailors and wharfingers.' 'Common' in that context meant 'open to serving the general public' or 'general'.[437]

With the rise of capitalistic trade and economics, common carriage become more explicitly associated with transportation networks, but its ties to public service, particularly in its obligation to serve the public as a necessary passage for information without unnecessary discrimination continues today. As technologies changed, these laws naturally evolved to include railroads and forms of transportation before ultimately being applied to communications networks.

Christian Sandvig notes that political scientist Ithiel de Sola Pool proposed expanding common carriage rules to new communication technologies, at a time when the internet was in its infancy.[438] In his 1983 book *Technologies of Freedom* de Sola Pool

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[436] Marsden, *Net Neutrality*.
[437] Noam, "Beyond Liberalization II," 436.
[438] Sandvig, "Network Neutrality Is the New Common Carriage," 143–144.

addresses this almost explicitly saying, "when resource constraints are severe and circumstances fit the historical situation of a common carrier, then norms exist."[439] Those norms guide how that media form should be treated. He then outlines a series of policies to enshrine freedom in communication systems such as non-discrimination, prohibitions on monopoly abuse and minimally burdensome regulations.[440] While de Sola Pool's suggestions are policy solutions, they reflect a conscious observation of the normative expectations given to communication technologies. Just as they applied to the cable and telephone technologies primarily discussed in Technologies of Freedom, those same norms apply to the internet today.

The last common carrier obligations were removed from internet connections in 2002 by the FCC under Chairman Michael Powell. Despite a lack of formal rules, the public backlash against ISPs who discriminatory filtering and throttling indicated some community expectations of nondiscrimination for internet content remained.[441] Following these incidents and the election of an administration more sympathetic to these causes, the FCC's 2010 Open Internet Order sought to preserve the norms of network neutrality through oversight regulation, rather than explicit legislation. The failed 2010 Open Internet Order can be understood as an attempt to preserve the norm of network neutrality despite strong industry pressure and with the support of only a fraction of the larger internet community.

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[439] de Sola Pool, *Technologies of Freedom*, 244.
[440] Ibid., 244–251; Sandvig, "Network Neutrality Is the New Common Carriage," 143.
[441] Marsden, *Net Neutrality*.

The *Verizon* ruling showed that this attempt to codify the norms of neutrality without revisiting existing common carriage policies was an untenable position.[442] Crawford argues the FCC's *Verizon* court loss is no surprise since the FCC "claimed, somehow, that it both repudiated the need for 'common carriage' rules and, at the same time, had the power to prevent discrimination by service providers" by using its power to reclassify broadband back to common carrier status.[443]

In the public eye, the distinctions between "network neutrality," "open internet," and "common carriage," continue to blur. Terms like "Open Internet" and "Network Neutrality" have become substitutes for talking about the principles outlined in common carrier rules.[444] Many supporters endorse the normative features of common carriage being applied to broadband, regardless of whether or not the specific legal and market implications of legal reclassification may be difficult or even impossible to enforce.[445]

The convergence of legacy media to a single internet platform has complicated these distinctions for network providers as well. For example, despite fiercely opposing to applying common carrier privileges for broadband, in 2014 Verizon reportedly took advantage of Title II common carrier privileges such as claiming utility right-of-way for constructing its fiber connections.[446] The company then used those same fiber connections for its FTTP FiOS internet service. This action is technically legal, because

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[442] Kimball, "Net Neutrality Is Over— Unless You Want It | Antenna"; Patel, "The Wrong Words."
[443] Crawford, "Back to the Digital Drawing Board."
[444] Sandvig, "Network Neutrality Is the New Common Carriage"; Guniganti and Grabowski, "Applying Common Carriage to Network Neutrality in the United States."
[445] Sandvig, "Network Neutrality Is the New Common Carriage," 145.
[446] Brodkin, "Report."

the company's phone service travels through the same fiber as its broadband. Examples like these challenge both the practical and legal distinctions between these different technologies.

5.2.1 Revisiting common carriage today

The effects of reclassifying internet service as a common carrier are unknown and may depend on whether it is applied in principle or by the letter of the law. Skeptics have warned that internet data is far different from the telephone data Title II in the 1996 law was designed to regulate, and therefore it may be counterproductive if not altogether technologically impossible to regulate them using the same rules.[447] Despite these claims, the common carriage rules neutrality advocates seek have less to do with the technical and legal description, than the original principles of fair, reasonable and uninterrupted treatment of access to a public resource. As can be seen in the next section, that expectation has been driven in part by the norms independence and openness coded into the early internet, but mobilizing those norms in support of neutrality has proved to be quite difficult.

5.3 Norming the net

In part, the norms associated with the internet are not inherent to its construction, but instead grew with it. But even though neutrality advocates have worked to connect NN to values associated with the internet's success, fragmentation within the larger internet using community over how those norms should be preserved has left the issue more susceptible to influence from political and economic powers.

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[447] Geddes, "Would the Real Network Neutrality Please Stand Up?".

These internet norms include concepts like decentralization, communitarianism, collaboration, transparency and open access.[448] Castells suggests the early producers and users of internet technology have intentionally embedded these values and beliefs ingrained in the internet.[449] He argues that the characteristics of several early internet groups including hackers, elites, communitarians and entrepreneurs who have ingrained in internet culture tendencies toward independence, decentralization, and collaboration.[450]

While these norms have been long included in discussion about internet culture, they have also been mobilized in defense neutrality. Examining some of the values embedded within discussions of the internet offer a deeper perspective for understanding the role of norms in the network neutrality debate.[451] McKelvey argues network neutrality further protect the values of the "open internet:"

> In actuality, a network neutrality principle makes a political stand by preserving the generative, perhaps radical democratic, aspects of the Internet. Participatory culture, social media, citizen journalism, and the creative commons depend on users being able to upload, broadcast, and share freely. Peers are the productive ends of the network.[452]

Conversely, neutrality advocates have used the values associated with the internet as a tool for popularizing the concept. Kimball observes that the principles behind NN gained more support when connected to the rhetoric of "internet freedom"

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[448] Zittrain, "What Matters in Net Neutrality," 31–35; Castells, *The Internet Galaxy*; Benkler, *The Wealth of Networks*.
[449] Castells, *The Internet Galaxy*, 36–37.
[450] Ibid., 60–61.
[451] "Network Neutrality Is the New Common Carriage."
[452] McKelvey, "Ends and Ways," 66.

and "open internet" initiatives compared the more technical and confusing "network neutrality."[453]

5.3.1 An open web

Open internet advocates say the web is a powerful democratizing, and community-building force and non-discrimination is an important aspect of preserving widespread access. The Internet has been described as the world's largest public commons.[454] The web is depicted as a place where online producers who create content are also often the users who consume it.[455] Non-discrimination standards like NN preserve the values of free speech and public discussion online.[456] Because of the internet's growing role as a vital information conduit, Nunziato argues broadband providers increasingly should follow the normative standard (if not yet legal compulsion) to serve as an unfiltered conduit for communication and to avoid prioritizing or discriminating against any legal forms of speech.[457] Guaranteeing un-filtered access preserves of the internet's role as a valuable public forum:

> As a conduit for information in this public forum for expression, broadband providers should be prohibited from engaging in bias and allowing dominant content or application providers to lock in their dominant positions and lock out disfavored content or applications.[458]

Senator Al Franken of Minnesota, one of the most vocal supports of network neutrality in the US congress, argued the maintaining network neutrality " is absolutely

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[453] Kimball, "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality.'"
[454] Marsden, *Net Neutrality*.
[455] Jenkins, *Convergence Culture*; Castells, *The Internet Galaxy*.
[456] Nunziato, *Virtual Freedom*.
[457] Ibid.
[458] Ibid., 149.

the First Amendment issue of our time."[459] Without content non-discrimination, journalism online (increasingly the dominant place for news consumption) may become cost prohibitive or subject to censorship from network operators. [460] Turilli, Vaccaro and Taddeo argue NN supporters have had success in framing neutrality as an ethical necessity for preserving access and fairness online.[461] They argue network neutrality position stems from a desire to enforce fairness across the Internet.

Fairness and access online may only be possible if trust and transparency are created between users and network operators. In a 2008 interview, open source software pioneer, Richard Stallman said he had no opposition to minor network management measures, but objected to ISP privileging some sites over others, which he described as "dishonest."[462] Benkler echoes this sentiment, suggesting the combination of transparent interactions and participation has helped make the web a revolutionary space for cultural production.[463]

Collaboration and cooperation has become a hallmark characteristic of the "open internet" as well. As a vocal supporter of open access and the benefits of collaborative networks, Benkler has emphasized the value of norms and practices like open access, peer production and collaborative innovation.[464] Expectations of open access to the web and collaborative technologies are in part a vestige of the free, openly-available protocols and systems like TCP/IP and WWW upon which much of the internet has

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[459] Hattem, "Franken."
[460] Stearns, "Net Neutrality and the Future of Journalism."
[461] "Internet Neutrality."
[462] Boyko, "The Morality of Neutrality: Philosophy with Richard Stallman."
[463] Benkler, *The Wealth of Networks*, 275.
[464] *The Wealth of Networks*.

been built.[465] The availability of these technologies allowed for the creation of a larger, unified web. Marsden argues neutrality preserves that ability to expand the community of the web:

> The open Internet is a commons for all to enjoy. That is the basis for claims that it should be preserved and regulation induced to prevent any more enclosure of that commons, while at the same time ensuring that the commons is not ruined by free-riders – that there is no 'tragedy of the commons'. The open Internet is by no means the only or necessarily the most important place for public opinion to be formed, but it is the open public space that gives legitimacy to all these private or semi-private spaces.[466]

While the normative strains of openness and collaboration are significant parts of what's described as "internet culture," there is also a strong emphasis on independence and community solutions.

5.3.2 A free web

The idea of "internet freedom" has become a particularly contentious issue in internet governance, making the formation of a larger consensus regarding network neutrality more difficult. Many of the concepts associated with "Internet freedom" are described in the influential cyberlibertarian (and former Grateful Dead lyricist) John Perry Barlow's "Declaration of Independence of the Independence of Cyberspace" in which he describes the Web as a new space outside of the industrial, geographical and political borders of the physical world.[467] Barlow acknowledges the many unspoken social understanding of online culture:

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[465] McKelvey, "Ends and Ways"; Marsden, "Introduction: Information and Communications Technologies, Globalisation and Regulation," 10.
[466] Marsden, *Net Neutrality*, 100.
[467] Barlow, "A Declaration of the Independence of Cyberspace."

> You have not engaged in our great and gathering conversation, nor did you create the wealth of our marketplaces. You do not know our culture, our ethics, or the unwritten codes that already provide our society more order than could be obtained by any of your impositions.[468]

This is an extension of the independent-minded and libertarian strains which continue to emerge in tech circles, particularly in those suspicious additional government or corporate involvement in Internet policy.[469] An extreme of this perspective as described by Thierer eschews network neutrality as a communitarian principle that puts an undue burden on network operators and potentially forestalls the development of future internet features.[470]

In the past, "internet freedom" has been used by neutrality proponents to describe the cause of freedom from content discrimination, as protection form state intervention and censorship online.[471] But in the wake of the 2014 *Verizon* ruling, neutrality opponents have adopted argued further FCC rules to "regulate the internet" would endanger "internet freedom."[472]

5.3.3 Preserving access and independence: a split in norms

Reconciling these sometimes conflicting beliefs with the history and structure of the internet offer a difficult challenge. While some believe the web is free, but that freedom is neither inherent nor permanent. While there may be a legacy of independence and libertarian views associated with the internet, at its extreme this

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[468] Ibid.
[469] Turner, *From Counterculture to Cyberculture*.
[470] Thierer and Szoka, "Cyber-Libertarianism."
[471] Morozov, "Passing Through"; Kimball, "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality'"; Cramer, "The Two Internet Freedoms."
[472] Cramer, "The Two Internet Freedoms."

view fails to fully acknowledge the strong role institutions have played in cultivating, monitoring and constructing the modern network of networks, its standards and practices.[473] As shown in previous chapters, the development and expansion of the internet, comes not from its independent development, but instead was built with the aid of governmental, academic and corporate institutions.

The norms of network neutrality seek to strike a balance between these competing interests: on the one hand, the internet's success is in part due to its reliance on wide-scale adoption made possible by the participation of external design and investment, on the other hand, intervention by those institutions which limits participation online reduces the value of the network as a whole. Thus, a troubling paradox reveals the extent to which "open internet" and neutrality are often associated, but not inherently tied: free internet advocates support an unregulated and independent internet, yet regulation may be necessary to secure that same independence. Designer of the World Wide Web system, Tim Berners-Lee has voiced the need to reconcile these the competing views of internet openness and internet independence for the sake of preserving access to democracy, knowledge, and free speech online.[474] He argues may be the best way to preserve the norms of neutrality:

> Yes, regulation to keep the Internet open is regulation. And mostly, the Internet thrives on lack of regulation. But some basic values have to be preserved. For example, the market system depends on the rule that you can't photocopy money. Democracy depends on freedom of speech. Freedom of connection, with

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[473] Goldsmith and Wu, *Who Controls the Internet?*; MacKinnon, *Consent of the Networked*; Morozov, *The Net Delusion*; Wu, *The Master Switch: The Rise and Fall of Information Empires*.

[474] "Net Neutrality: This Is Serious"; Berners-Lee, "Long Live the Web."

> any application, to any party, is the fundamental social basis of the Internet, and, now, the society based on it.[475]

Without consensus from the wider internet community to preserve these values through norms, regulatory action may be one of the few options remaining.

5.4 Stakeholders and governance

In part, translating these norms and values into policy has been the goal of international internet governance groups, however the widely-varying agendas of participants and unclear goals have proven these groups to be ineffective in articulating any clear consensus regarding network neutrality. The failure to find common ground regarding basic standards of access online potentially endangers the larger global internet system. At worst, failure to find common ground regarding NN may lead conflicting approaches to internet service of the web and ultimately a "federated internet."[476] A balkanization of the internet into connected factions would prove a barrier to the global flows of information that has typified the internet's growth.[477] To combat the threat of a globally divided web and preserve the positive network effects of a globally-connected internet user base, many organizations including governments, international governing bodies and civil society groups continue to seek common ground for consistent, global internet standards. But despite ongoing nods and statements supporting openness, access and interest freedom from

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[475] Berners-Lee, "Net Neutrality: This Is Serious."
[476] Noam, "Towards the Federated Internet"; Goldstein, "The End of the Internet?".
[477] Schmidt and Cohen, *The New Digital Age*; Goldstein, "The End of the Internet?".

5.4.1 Promise and peril of global internet governance

Through the Internet's history, its global standards have been created from a patchwork of interested groups including technology advocates, government regulators and corporate interests. Non-governmental organizations such as the International Corporation for the Assigning of Names and Numbers (ICANN), Internet Engineering Task Force (IETF), the World Wide Web Consortium (W3C), the Internet Governance Forum (IGF) have played a particularly significant role in making technical decisions such as the process for top-level domain names and key technological upgrades.[478] These organizations work to develop governing principles through collaboration of interested parties and participants.[479]

While states have traditionally crafted their own media policies, these key NGOs have taken an active role in events discussing the future of internet governance, particularly by their participation in multistakeholder events in which national representatives, NGOs, corporate representatives and members of civil society (like academics) participate.[480] Theoretically, these "stakeholders" would participating in meetings and discussion panels, working together to find common ground on issues like standard-setting for protocols, website naming processes, privacy expectations, and other governance issues such as network neutrality.

The inclusion of civil society groups, like the previously-mentioned NGOs may indicate an acknowledgement of the public interest in internet governance and be more

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[478] Goldsmith and Wu, *Who Controls the Internet?*.
[479] Mueller, Mathiason, and Klein, "The Internet and Global Governance," 239.
[480] Mueller, Mathiason, and Klein, "The Internet and Global Governance," 239.

vocal in their support of network neutrality.[481] However, many of the most prominent civil society groups involved in these discussions often have strong ties to US private sector corporations, and thus may not speak for the larger public interest.[482]

Some participants in these events have become particularly vocal in supporting network neutrality during these global talks. The Internet Society (ISOC), one of the oldest Internet policy NGOs (and co-founded by Cerf,) has taken a strong position in supporting network neutrality with an emphasis on keeping Internet "open" or unrestricted.[483] In a 2010 interview, ISOC head Jon McNearey emphasized the organization's support of NN with an emphasis on its benefits to business innovation – linking the concepts of Internet "freedom" with its benefits to commerce.[484]

The most significant events of international governance come from policy statements created during global conference events. The composition of these events significantly affects the policies agreed upon, though none have explicitly endorsed network neutrality and some have taken marked steps toward more content discrimination rather than less.

For example, the 2003 and 2005 World Summits on Information and Society (WSIS) resulted in nominal proposals for internet governance, but little change.[485] Each noted the importance of access to information technologies, freedom of expression and the ITU has attempted to expand its role in policy and standard-setting decisions. At the

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[481] Raboy, "The WSIS as a Political Space in Global Media Governance," 63.
[482] Powers and Jablonski, *The Real CyberWar: The Political Economy of Internet Freedom*.
[483] Internet Society, "Net Neutrality - Internet Issues."
[484] Halliday, "Net Neutrality Is 'Big Issue', Says Internet Society Chief."
[485] Mueller, Mathiason, and Klein, "The Internet and Global Governance."

ITU's World Conference on International Telecommunications private, civil society groups and NGOs may participate, but only nations are allowed to vote on policy outcomes. Recently, the ITU made gestures toward taking a more active role in Internet governance, including recommending potentially non-network neutral policies under the auspices of greater network management power for participating countries at its 2012 meeting.[486] At that event the majority of countries participating in the event voiced support for great ITU involvement in internet governance and the non-neutral practices it initially proposed.[487] These moves to make the web less neutral were roundly criticized by the US and others for potentially limiting expression and commerce online.[488]

International indecision regarding network neutrality continued at the April 2014 NETmundial event which allowed all multistakeholder groups to participate in the creation of its policy declarations.[489] Prior to the event, the host country of Brazil passed as sweeping Internet bill of rights including nods to added privacy and neutrality.[490] Because of that, along with a more inclusive participation groups, the event appeared set to outline more specific statements regarding network neutrality internationally. While the NETmundial concluding statement includes nods to internet openness, freedom of speech and other norms associated with the web, the document proposes

[486] Downes, "Why Is the UN Trying to Take over the Internet?"; Farivar, "The UN's Telecom Conference Is Finally Over. Who Won?".
[487] Farivar, "The UN's Telecom Conference Is Finally Over. Who Won?".
[488] Ibid.
[489] Powles, "Big Business Was the Winner at NETmundial."
[490] Boadle, "Brazilian Congress Passes Internet Bill of Rights."

universal, opportunity and access, rather than explicit network neutrality.[491] Critics say this milquetoast response is equally due to both the slow, majoritarian multistakeholder process as well as the powerful corporate voice in these deliberations.[492]

The extent to which Internet governance will ever truly be a multistakeholder endeavor remains unknown and the prospects for consensus around network neutrality appears to be slim. Though As Goldsmith and Wu have noted, the US's powerful influence in web protocol decisions and its influence the participants of these debates should not be understated.[493] While no firm neutrality policies have emerged from these meetings, the proposals emerging from WSIS, WCIT and NETmundial show potentially diverging trajectories regarding the issue.

International internet governance deliberations holds the promise of setting standards for an increasingly inclusive and global internet, but the weakness of these international declarations and the influence of already powerful corporations and governments remain an enormous barrier to the success of international multistakeholder events. While thus far these events have made gestures toward the norms and values of network neutrality like open access to technology, freedom to connect online, and freedom from targeted discrimination, these statements have remained incredibly vague.

In the last ten years, global governance events have more openly involved representatives from non-national groups like corporations, NGOs and civil society

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[491] Powles, "Big Business Was the Winner at NETmundial"; NETmundial, "NETmundial Multistakeholder Statement."
[492] Powles, "Big Business Was the Winner at NETmundial."
[493] *Who Controls the Internet?*.

participants. At the same time, the policies outlined in meetings like the ITU's WCIT have become increasingly less sympathetic to the normative concepts underlying network neutrality. This may be in part because of the composition of voting parties. It appears that events with increased participation from multistakeholder groups civil society groups and NGOs (like NETMundial and WSIS) in level of participation resulted in stronger values linked to the principles of network neutrality, and investigating this offers many opportunities for future studies. Nonetheless, despite multiple policy statements from multistakeholder and international events gesturing toward network neutrality norms, as of this document's publication none have explicitly supported network neutrality and there appears to be less community consensus regarding the basic aspects of internet governance, let alone clear support for NN.

5.5 Conclusion: Is the public awake?

Today, both entertainment and activism travel across the same networks. The norms of network neutrality have established to users that both light entertainment and life-or-death matters can be shared equally and reliably. Users generally expect a similar level of service whether looking up the humorous online feline Grumpy Cat, news of civil wars and international conflicts, or organizing a political protest.[494] And in fact, more often the popularity of these networks as sources for news and entertainment

[494] Howard and Hussain, "THe Role of Digital Media"; "Grumpy Cat® - The World's Grumpiest Cat!".

allow for political speech in places that would otherwise be censored.[495] Major shifts in how the internet is governed and perceived, such the current network neutrality upheaval or the 2013 NSA online spying revelations, potentially undermine trust online.[496]

The internet has been lauded for its ability to recentralize the voice of the public and recently some users have been mobilized to participate in the rules that govern the internet itself. In 2012, internet companies and users reacted to a series of bills proposed to more heavily enforce intellectual property laws online with a massive campaign of letter-writing, emails and website blackouts.[497] These efforts were in part reinforced by online content companies like Google that could be materially affected by the laws, the public outcry, however, did not appear to be spurred by web companies alone.[498]

In the case of NN the amount of public support is less clear. In part, this may be because of the opacity of the concept's technical and legal background. A 2014 Pew report examining the issue noted that network neutrality debate has been sporadically covered in traditional television and newspaper press.[499] The study showed between January and May 2014, network neutrality was addressed in only 25 of the over 2,800 television news programs directly addressed network neutrality. It also showed that the lion's share of neutrality coverage in print appeared in only six newspapers. While the Pew report noted that interest in Twitter and in Google searches appeared to be much

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[495] Zuckerman, "The Cute Cat Theory Talk at ETech"; Youmans and York, "Social Media and the Activist Toolkit."
[496] Shahani, "A Year After Snowden, U.S. Tech Losing Trust Overseas."
[497] Ammori, "Internet Freedom Day."
[498] Gross, "Who Really Was Behind the SOPA Protests?"; Tassi, "Reddit's SOPA Blackout Admirable, But Google and Facebook Must Follow - Forbes."
[499] Olmstead, Hitlin, and comments, "Net Neutrality."

more active, the subject continues to occupy a relatively slim niche. A 2010 focus group study by Quail and Larabie suggests that sporadic and incomplete coverage of the network neutrality issue may lead to a lack of knowledge regarding the complex history and implications of the issue for the larger public.[500] But there may be reason to believe interest in network neutrality growing.

5.5.1 Verizon ruling aftermath

In the wake of the 2014 Verizon ruling, the gears of public internet governance activism appear to be moving once again. Spurred by calls from open internet advocacy groups and wider mainstream coverage of the usually banal subject of telecommunications policy, there may be signs of a renewed public interest in network neutrality.[501] The FCC's proposed rule revisions suggesting ISPs be allowed to create separate, premium-service "fast lanes" sparked a wave of concern that the norms of network neutrality had been forsaken by the only government agency with power to preserve them.[502] FCC chairman Wheeler later removed the "fast lanes" provision of the proposal in response the wave of public outcry.[503] As the public comment period for the FCC's revised rules continued, pro-neutrality activists and organizations have camped in front of the FCC's offices,[504] protested outside of ongoing FCC hearings,[505] and signed petitions supporting the preservation of network neutral policies.[506]

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[500] Quail and Larabie, "Net Neutrality."
[501] Nagesh, "FCC's Net-Neutrality Proposal Faces Public Backlash."
[502] Ibid.
[503] McCormick, "FCC Chairman Reportedly Revises Net Neutrality Proposal after Public Outcry."
[504] Fung, "Net Neutrality Protesters Are Literally Camped Outside the FCC. And the Agency Is Hearing Them Out."

News and entertainment coverage has also raised the profile of the issue. One notable example, a 14-minute segment on the HBO comedy / news show *Last Week tonight with John Oliver*, gained wide attention for its clear, but humorous take on the issue.[507] In the segment, Oliver rails against the FCC's regulatory process, the powerful influence of the cable industry, and the lack of broadband competition.[508] Oliver argues,

> The cable companies have figured out a great truth of America: if you want to do something evil, put it in something boring. …that's why advocates should not be talking about protecting net neutrality, they shouldn't even use that phrase. They should call it 'preventing cable company f--kery.'[509]

The video prompted a wave of attention and responses from the public. During this period the site was briefly hacked which temporarily disabled the commission's nearly 20-year-old commenting system.[510] Despite website delays, the FCC's public comment website was flooded with over 45,000 comments in two days following the segment's original airing.[511] Since its initial posting on June 1, 2014 the video has received over 4.6 million views on YouTube.[512] In the 60-day comment period, the FCC reportedly received over 1.1 million public comments regarding the commission's proposed open internet rules.[513] These responses ranged from the profane to the

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505 Silver, "Hundreds Protest Outside FCC Net Neutrality Hearing."
506 Staff and agencies, "Google, Facebook and Amazon Write to FCC Demanding True Net Neutrality."
507 *Last Week Tonight with John Oliver*.
508 Ibid.
509 Ibid.
510 Gustin, "The FCC Was Hacked After John Oliver Called for Net Neutrality Trolls."
511 Hu, "John Oliver Helps Rally 45,000 Net Neutrality Comments To FCC."
512 *Last Week Tonight with John Oliver*.
513 Nagesh, "FCC's Net-Neutrality Proposal Faces Public Backlash". For comparison, The open internet comments are on pace to outnumber the nearly 1 million complaints the FCC received regarding the Janet Jackson/Justin Timberlake "wardrobe malfunction" incident at the 2004 Super Bowl.

insightful, with about half coming from commenters themselves (rather than form letters.)[514] While the outcome of the FCC's rules revision remain unclear at publication, the enormous response to the issue may be a sign that the public is tuning in.

5.5.2 If not norms?

Discussing the parameters of network neutrality in terms of economics or technology is complex – the technicalities and ambiguities of maintaining, enforcing or removing systematic content neutrality cross many different systems with dramatically different needs may be nearly impossible. By comparison, norms may appear far more easily understood, but that has not made them more effective. Just as the protocols, regulations and market interactions have shaped the norms of neutrality and the internet – they have the power to erode them. The ideals of openness and independence are deeply embedded within today's NN debate. Without a united, informed community consensus regarding the issue norms lack the power to regulate. Instead, the principles of non-discrimination and public access to the web may be more securely preserved by through policy action instead.

[514] Hu, "A Fascinating Look Inside Those 1.1 Million Open-Internet Comments."

6 CONCLUSION

This concluding chapter includes summaries of the key elements uncovered in this project and propose a series of policy recommendations based on its findings. It highlights the key contributions and effects of architecture, markets and norms on network neutrality regulation on US policy. It acknowledges the challenges of expanding network neutrality internationally and offers a series of policy recommendations based on the findings of this project's comparative case studies. Finally, the chapter concludes with a discussion of this project's limitations and offers suggestions for how future projects may expand on its findings.

6.1 An uncertain future

The 2014 *Verizon* ruling was only the most recent in a series of ongoing skirmishes over network neutrality in the US. While nominally the debate is between network operators and regulators, it has implications for how information is owned, created, and distributed in an interconnected world. The power to distribute, manipulate and wield information has been incredibly valuable.[515] The terms and conditions upon which this information is moved (or blocked) may have serious economic, social and political ramifications. This multi-modal examination of network neutrality was conducted with these considerations in mind.

Information carriage is incredibly important, yet sometimes invisible. As globally-connected digital communication becomes an increasingly significant part of daily life and commerce, this is truer than ever. The regulations dictating how

[515] Innis, *Empire and Communications*; Mattelart, *The Information Society*.

information travels the web impacts the news we read, the entertainment we enjoy, the communities we interact with, and the choices we make. Lessig's four modalities (laws, architecture, markets, and norms) have provided a way to unpack these regulations by isolating them while also contextualizing them in relation to each other.[516] In the case of network neutrality, this means examining the ongoing influences of technological changes, economic conditions, public beliefs, and policies that have shaped how information moves online.

This project began with the following two research questions:

RQ1: How have laws, norms, architecture, and markets each contributed to the current NN regulatory framework in the US?

RQ2: How can the policy responses to market, architecture, and normative regulation of NN in select international case studies inform future network neutrality policy in the US?

In answering them, the previous chapters have offered a series of comparative case studies examining a wide range of subjects in pursuit of unpacking their relationship to the current network neutrality conditions. These examinations of how architecture, markets, norms have affected network neutrality regulation and policy in the US suggest a fascinating and complex web of rules, habits and customs.

6.2 Failure on multiple levels

In analyzing these modalities in relation to network neutrality, it is glaringly clear how intertwined they truly are. Architecture, markets, norms, and policy have played a part in the reinforcement of network neutrality. No single aspect of Internet regulation has been able to thoroughly protect the principles of equal access and

[516] Lessig, "The Law of the Horse"; Lessig, "The New Chicago School."

content non-discrimination. At some point each principle of network neutrality has fallen victim to ongoing systematic failures, regulatory short-sightedness and sometimes deliberate undermining by powerful network owners and operators.

Following the stripping of common carrier obligations from US broadband carriers in the early 2000s and the institution of a handful small FCC policy measures, US network neutrality policy has increasingly depended on architecture, markets, and norms to preserve the principles of content non-discrimination and access. As the internet becomes increasingly significant to all aspects of life and commerce, the weakening of network neutrality threatens to mortgage the networks long-term potential in exchange for short-term gains. This project highlights the fragility of each of those modalities both in the US and abroad as well as the need for more robust network neutrality policy. Each of the modalities offers potential for creating a more neutral web, but as the previous chapters have also shown, each is also susceptible to coercion, corruption, and division.

6.2.1 Architecture

The architecture of the internet is both complex and steadily evolving. As Lessig has argued, architecture is a created through its designer's choices and the web users know today is as much a result of its initial design protocols as the newest technologies used to manage it.[517] Not surprisingly, the internet of today is far different from its origins as ARPANET. However some key elements such as its end-to-end design and

[517] Lessig, *Code*.

the TCP / IP protocols that have remained a significant part of the internet's structure.[518] But these protocols are not the only ones important to the internet's structure. While new protocols have made it possible to transfer data at speeds and quality levels its creators could not have imagined.

Today's web is used for far more than basic text and email. Media of all types — from telephone and video — are all being carried out across the network of networks and these diverse media sometimes require drastically different technologies to function. Increasingly sophisticated network management technologies have also made it possible for network owners to manage this convergence, but they have also developed the tools to identify, prioritize and potentially slow or block specific types of content.

Lessig famously declared that "Code is law" – but that law is not fate. Architecture is often adopted, adapted, modified, or discarded. Some have claimed high-capacity, high-speed fiber networks and technologies off a potential breakthrough for creating non-discriminatory networks.[519] But in the cases of Australia and New Zealand, these have so far not been the case. Even though both countries continue to invest billions of dollars into constructing publically-owned, unbundled infrastructures, these measures have done very little foster an atmosphere more favorable to network neutrality. While these new infrastructures may create a more competitive market for internet service, existing network policies allowing data caps and content throttling

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[518] Latham, "Networks, Information, and the Rise of the Global Internet"; Lemley and Lessig, "The End of End-to-End."
[519] Isenberg, "The Dawn of the Stupid Network"; Fung, "This Practically Ancient Internet Technology Supports Speeds 1,000 Times the National Average."

remain. However, the persistence of discrimination in Australia and New Zealand despite increased bandwidth across publically funded networks undercuts the claim by US network owners that usage charges and limits are necessary to fund network improvements.

6.2.2 Markets

For some time the network neutrality debate appeared to be a duel between content providers and networks with users and CSPs uploading and downloading increasingly large volumes of data and IPSs and network owners seeking more tools for managing traffic and recouping the costs of network management. But increasingly these divisions have become further fragmented.

As the largest ISPs and CSPs grow, their influence and power increasingly distorts both the internet economy and the balance of power regarding network neutrality. Network providers have long sought the tools to further capitalize on their powerful position as content gatekeepers and the convergence of content onto the Internet has only increased their power. The largest content providers – with both millions (sometimes billions) of users and billions of dollars, have the clout to negotiate favorable agreements with networks, while smaller content providers have much less leverage when negotiating agreements like peering and interconnection.

Vertical integration, high-profile mergers, and acquisitions of content producers by network owners and the expansion of CSPs like Google into the development of fiber infrastructure allows these corporations to gain further economic advantages with or without neutrality. These vertical mergers have given the most powerful players in

the internet markets even more profits and less competition.[520] With little support for blocking these integrations, regulators like the FCC have traded short-term neutrality agreements in exchange for approving mega-mergers like the one between Comcast and NBCUniversal. Under the banners of deregulation and free markets, regulators and legislators have allowed (and sometimes) aided this concentration of media powers. Proponents have argued network neutrality offers some of the last remaining tools for checking the power of gatekeeper network operators.

This stands in contrast to the market system used throughout the EU where markets have played a more central role in the Internet regulation. A conscious separation of ISPs from network ownership (known as unbundling) has resulted in more competitive markets for internet service and potentially less incentive for ISPs to slow or block certain types of content. While some countries like the Netherlands have been on the vanguard of instituting pro-neutrality regulations, broadband in the EU is far from perfect.[521] Recently threats of content censorship have come not from corporate actors, but from laws and policies seeking to strike a balance between online information, privacy, and public norms.[522]

The broadband markets in the EU and elsewhere are the result of a different history and different policies than those in the US. Many European systems are partially the result of formerly state-constructed, centralized broadband and telecommunications

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[520] Carr, "In Modern Media Realm, Big Mergers Are a Bulwark Against Rivals - NYTimes.com."
[521] van Beijnum, "Netherlands Becomes World's Second 'Net Neutrality' Country."
[522] Clark, "UK Gov Wants 'Unsavoury' Web Content Censored"; White and Benoit, "'Google It' Becomes 'Hide It' After Right to Be Forgotten"; Goldsmith and Wu, *Who Controls the Internet?*.

networks, which are far different than the patchwork of private systems.[523] Instead, much of the US policymaking regarding network neutrality has been debated on economic grounds, and often centering on its potential to help or harm innovation and competition.[524] This has shaped network neutrality's meaning and implications for the culture at large.

6.2.3 Norms

The effect of norms on network neutrality is one of the least traceable aspects shaping non-discrimination regulation, yet it may potentially be the most important. Normative regulation relies on the community support for enforcement. Wider support means stronger normative rules, divided support means less powerful norms. The strength of the norms underlying network neutrality like non-discrimination and equal access to public resources have seen mixed support. These norms were first seen in the ancient laws of common carriage, which protected good, and passengers have been passed down from carriages and railroads to the communications technologies of today.

But despite their long history, policies reflecting those norms are far from a given. As was seen with the creation of the FCC's Cable Internet Order, policy choices and other norms (like deregulation) may overtake previous norms. However, the ongoing persistence of the network neutrality debate may be an indication that these norms have not disappeared, but instead taken a back seat to more powerful policy influencers.

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[523] Eli M. Noam, "Regulation 3.0 for Telecom 3.0."
[524] Quail and Larabie, "Net Neutrality."

The internet has not only been associated with the values of democracy, community but also independence from oversight. In part, the division between the meanings and values associated with the "free internet" and "open internet" may have held back the larger a wider community of internet users from supporting network neutrality. While politicians and activists have attempted to mobilize the term "open internet" as a euphemism for NN, the effectiveness of this to translate into wider policy change appears inconclusive.[525]

The extent to which these norms can be fashioned into functional and scalable policy remains up for debate. The issue has received notable attention at several international multistakeholder meetings, but beyond lip service to "internet openness" little has been done. Neutrality policies have been enacted in other countries like the Netherlands (and temporarily enforced in the US) but, to reap the larger network effects of a global web, protections against discrimination must ultimately extend beyond the handful of most progressive countries.

Norms depend on wider community support to exist and thus are often flexible and fleeting. A united public support for neutrality principles may yield greater attention to these issues and reinforce the value of access and content non-discrimination. Conversely, the systematic weakening of network neutrality rules not only gives network gatekeepers greater power in the short-run, it also potentially weakens the ideals of democracy, communitarianism, and independence associated with the internet.

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[525] Kimball, "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality.'"

6.3 Many approaches, in the US and abroad

In the US, each of these aspects has affected the network neutrality debate and its future. In the last decade, FCC policies have both helped and sometimes hurt the cause of open access and content non-discrimination online. Some decisions like the Cable Internet Order created significant setbacks for neutrality, while nominally promoting network expansion. Others like the 2010 Open Internet Order have nominally supported neutrality, but appear to have largely maintained the status quo from increasingly powerful network operators. Legal decisions like the 2014 *Verizon* ruling have made the FCC's position of supporting neutrality increasingly difficult.

Each country's unique history affords them different opportunities and challenges for developing internet policies in general and neutrality regulations specifically. While discussions about open Internet policies are happening all over the world, neutrality policies are instituted unequally. Several European countries, including the Netherlands, have passed strong neutrality laws.[526] Some regions, like the European Union have crafted market-oriented policies seeking to reduce discrimination through competition.[527] However, many countries have no expectation and no near-term prospects for content neutrality online.[528] Others, like China have instituted highly institutionalized and powerful political censorship mechanisms into the internet infrastructure itself.[529]

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[526] van Beijnum, "Netherlands Becomes World's Second 'Net Neutrality' Country."
[527] Marsden, "Net Neutrality in Europe."
[528] Talbot, "In Developing Countries, Google and Facebook Already Defy Net Neutrality."
[529] MacKinnon, *Consent of the Networked*.

Because of these inequalities, the expectations of network neutrality vary greatly. Like the US concept of free speech, neutrality has potential benefits but also unforeseen consequences across cultures. These disagreements have stood in the way of creating a wider community consensus behind non-discrimination norms making US and international governance regarding the issue particularly complex and often ineffective. Today, there is no "one size fits all" network neutrality rule that can work around the world.

6.4 Policy considerations and recommendations

Some have argued for a balanced approach to broadband network discrimination that acknowledges the potential abuses by network providers as well as recognizing acceptable conditions for network management.[530] This would require a large degree of transparency and trust on behalf of all parties involved. The existing policies of NN have been constructed through an amalgamation of laws, stakeholder relationships and technological developments. The normative values upon which the NN debate takes place have been established through the historical emergence of the issue as well as the cultural and evaluative perspectives of the values associated with the global information networking.

One side effect of the 2014 *Verizon* ruling was a legal reinforcement of the FCC's jurisdiction to regulate the internet – a power with some open internet advocates have warned may set a bad precedent for the agency's ability to interfere with the web in the

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[530] Peha, *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*.

future.[531] This balance of neutrality norms means balancing the public's desire for robust regulation of powerful network operators, while also reassuring suspicions of government overreach online.

With this tension in mind, Marsden has argued for a co-regulatory or self-regulatory standard in which stakeholders (ISPs, CSPs, NGOs, and governments) agree to enforce a normative standard for non-discrimination.[532] With the exception of some abuses, this has largely been the status quo in the US. The FCC's 2010 Open Internet Order nominally enforced standards supporting NN with some flexibility for network QoS, tiered pricing and interconnection negotiations. In the co-regulatory model, networks would be discouraged from closed or discriminatory behavior for fear of market reactions and public outcry.

Co-regulation and self-regulation may offer an acceptable approach to promoting neutrality without onerous regulations, but it may not be effective in all situations. In the EU where regulations must be applied across many different national infrastructures and ISP competition is more robust because of unbundling, co-regulation may offer a way to establish more general, common-ground principles for internet governance. However, in the US network owners and ISPs are often the same and competition is less robust, this option seems more susceptible to manipulation and inefficiency.

Following Verizon's successful legal challenge, the FCC's authority to regulate internet communication was reaffirmed, but the agency has exhausted nearly all

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[531] McSherry, "Is Net Neutrality a FCC Trojan Horse?".
[532] Brown and Marsden, *Regulating Code*; Marsden, *Net Neutrality*.

options short of reclassification for preserving network neutrality. Some have argued that content and pricing discrimination may be better challenged on antitrust grounds by agencies like the Federal Trade Commission or Justice Department, particularly as network providers increasingly merge and vertically integrate.[533] While the FCC has made broadband network neutrality a stipulation of several large telecommunications mergers, these stipulations are only temporary a solution to long-term problems.

6.4.1 Political landscape for network neutrality today

Political change is unpredictable. As chapter two showed, the policy history of network neutrality in the US is marked by unexpected successes, remarkable failures, incremental developments and rapid shifts in political and social momentum. Legislation and legal decisions often have significant and unexpected results – the recent Verizon decision is just the most recent example. With these reservations, the following policy recommendations attempt to take into consideration the current political and regulatory environment for internet regulation in the US.

Clear **legislative policies supporting network neutrality appear less likely** in the short-term. Though a handful of neutrality-relevant bills (both for and against) have been suggested following the 2014 *Verizon* ruling, these appear to be largely political gestures.[534] While US President Barack Obama has expressed support for network neutrality and other "open internet" policies, **the President's support has not**

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[533] Sasso, "Forget the FCC—Should the FTC Enforce Net Neutrality?"; Boliek, "Fcc Regulation Versus Antitrust How Net Neutrality Is Defining the Boundaries"; FCC Panel, *Ensuring Competition on the Internet*.

[534] Finley, "Democrats Aim to Reinstate Network Neutrality With New Bill"; Eggerton, "Latta Bill Would Block Title II."

translated into robust political action since at least 2010.[535] In part, the lack of more political attention to the issue (from both the legislative and executive branches) may be due to the telecommunications industry's sizable lobbying and campaign donations.[536] This has raised concerns about **regulatory capture and a "revolving door" regarding telecommunications oversight** in general, extending to the FCC. This was particularly apparent with the appointment of FCC chair Wheeler, a former lobbyist for the telecom industry.[537]

6.4.2 Network Neutrality policy proposals

Just as the symptoms span all four modalities, so should the treatments. The following recommendations are informed by this projects analysis of the US approaches and regulation of network neutrality, along with comparative examinations of each chapter's international case study. They range from minor oversight suggestions such as improved merger and transparency oversight to instituting a separations principle that would result in a wholesale restructuring of the US media and broadband industry. While it is conceivable that all or none of these proposals are translated into law, they each offer elements that would promote a more net neutral and non-discriminatory web.

Recommendation 1: Robust transparency enforcement

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[535] Broache, "Obama Pledges Net Neutrality Laws If Elected President"; Brodkin, "Obama on Net Neutrality"; Fung, "What to Make of Obama's Tepid Response on Net Neutrality."
[536] Drutman and Furnas, "How Telecoms and Cable Have Dominated Net Neutrality Lobbying."
[537] Olsen-Phillips, "Obama Bundler Tom Wheeler Helps His Former Industry from FCC Perch."

Initial transparency and reporting requirements instituted in the 2010 Open Internet Order should be preserved and potentially expanded. If policymakers were to **require monitoring and reporting of internet speeds from both users and content providers**, it may create an atmosphere of greater transparency regarding internet distribution. While there are technological factors (such as the testing services which sometimes report drastically different results,) efforts to monitor and report results offer one of the few options for keeping ISPs and networks accountable to the public.[538]

Unfortunately, transparency is vague and hard to assess by regulators. For instance, despite EU policies calling for greater traffic management transparency, the 2012 EU investigation revealed widespread ISP throttling and other discriminatory practices.[539] Unless regulators **ensure transparency requirements are measurable and consistently enforced**, they may not be particularly successful in fostering an atmosphere of non-discrimination. But transparency should also extend beyond traffic management to the increasingly significant practice of ISP interconnection agreements that lie in a NN gray area.

Recently, the public conflict between Netflix and Verizon (and to a lesser extent Comcast) has revealed many of the more complex negotiations between CSPs, backbone and last-mile providers. The FCC's announced investigation into interconnection and peering agreements is hopefully a first step toward more scrutiny of this increasingly

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[538] Ingram, "Is Net Neutrality Dying?".
[539] BEREC, *A View of Traffic Management and Other Practices Resulting in Restrictions to the Open Internet in Europe*; BEREC, *BEREC Publishes Net Neutrality Findings and New Guidance for Consultation*.

vital, but underreported aspect of the internet ecosystem.[540] A clearer, more understanding of these relationships by the public may potentially highlight the need for more established rules and principles guiding Internet carriage in general.

Transparency has been included in the FCC's revised 2014 rules proposition and may be the most likely of any proposed neutrality rules. Strong transparency, if properly executed and enforced, may offer the public a more informed position regarding internet architecture, traffic management, and potentially levels the market negotiations between users, CSPs and ISPs.

Recommendation 2: Heightened merger, acquisition and antitrust scrutiny

Along with the cooperation of other regulatory organizations like the FTC and Justice Department, **increased scrutiny should be placed on the mergers, acquisitions and competitive ecosystem of telecommunications corporations**. While European-style unbundling or separations policy would be one way to increase competition across broadband markets that does not appear possible in the US system without a large scale restructuring of the telecommunications sector in general. Also unlikely in the near-term, is a wide-scale centralized re-construction and development of broadband systems, such as has been seen in Australia and New Zealand.

The FCC's application of network neutrality regulations to merger approvals is a notable example of applying stricter requirements to these business transactions. Another possibility is to use the treat of Title II reclassification as a negotiating lever for exacting greater transparency or competition guarantees from existing network

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[540] Knapp and Johnston, "Internet Traffic Exchange: Time to Look under the Hood."

operators. **The FCC should clarify and update its definition of broadband internet beyond the current 4 Mbps range.**[541] Currently, that low definition allows wired internet providers to list wireless and mobile phone providers as adequate competition – thus thwarting greater antitrust scrutiny. When wireless providers are not considered competition to wireline providers – the amount of competition is greatly reduced in most areas.[542]

Finally, policymakers should continue to **encourage the development of fiber and high-speed competition** to the current Cable / DSL regime and fight legal restrictions banning the development of municipal fiber.[543] The advent of extremely high-speed networks has the potential to greatly reduce the scarcity threat upon which most ISPs base content management and pricing discrimination.[544] Advocates like Crawford have argued strongly for the further development of municipal fiber-to-the-premises networks that offer services more in line with the public interest of those localities while also creating more competition for incumbent providers.[545]

Recommendation 3: Reclassification in lieu of new internet-specific laws

Because of their sometimes exclusive and often vital role in commercial and daily life private transportation networks have been held to common carriage standards for

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[541] Fung, "The FCC May Consider a Stricter Definition of Broadband in the Netflix Age."
[542] Crawford, *Captive Audience*.
[543] Masnick, "Why Does Rep. Marsha Blackburn Want To Block You From Having Competitive Broadband?".
[544] Isenberg, "The Dawn of the Stupid Network"; Feld, "An Examination of the Economics of Whitacre Tiering."
[545] Crawford, *Captive Audience*, 260–265.

hundreds of years.[546] Today, the classification of broadband Internet service as an information service rather than a telecommunications service is the result of a political choice and the lack of an alternative between the two. The past 25 years of FCC internet policy have been marked by ongoing attempts to reconcile the needs of the modern web with the rules laid out in the Telecommunications Act of 1996 – a document designed for a different time and aging technologies.

The initial division of computing versus voice transmission was conceived in the 1970s as an attempt to prevent the AT&T monopoly from exerting too much control over that emerging field.[547] Today, because of its classification as an information service, a similar threat has emerged – the potential for abuse by gatekeeper networks seeking to extract rent and market position thanks to their valuable role in the communications ecosystem. Just as in the 1970s, the classifications of today are not adequate for the growth of technology and the needs of the larger public.

The 2014 *Verizon* case struck down aspects of the 2010 Open Internet Order that were too similar to Title II telecommunications, but did not deny the FCC's power to reclassify broadband altogether.[548] Many network neutrality supporters have argued reclassification to Title II is the clearest way forward to preserve the "open internet."[549]

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[546] Jones, "The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective."
[547] Wu, *The Master Switch: The Rise and Fall of Information Empires*.
[548] McMillan, "The Case for Net Neutrality's Nuclear Option"; Silberman, Wilson Rogers, and Tatel, Verizon Communications Inc. v. Federal Communications Commission (2014) (United States Court of Appeals for the District of Columbis Circuit 2014).
[549] Brodkin, "Make ISPs into 'Common Carriers,' Says Former FCC Commissioner"; Guniganti and Grabowski, "Applying Common Carriage to Network Neutrality in the United States"; Cerf, "'Father of the Internet'"; Crawford, *Captive Audience*; Crawford, "Back to the Digital Drawing Board."

Because of the prior court rulings, Crawford argues reclassification may be one of the only options left for the FCC use in preventing online content discrimination:

Without the right administrative label applied to these services, every step the commission takes to address these problems will be subject to a protracted battle over whether the FCC is impermissibly treating the network providers as 'common carriers.'[550]

This approach would re-apply common carrier obligations to internet service in the US, however its unclear how the policy's other restrictions would affect web service. Some (including the ISPs themselves) have argued common carrier rules would create onerous burdens on network operators and may be virtually impossible across internet systems – because of how data is transmitted.[551]

One option available today would be for the FCC to **reclassify internet service under the existing Title II telecommunications rules in the Telecommunications Act of 1996, but with selective forbearance.** This action would restore common carriage rules to internet service while selectively ignoring Title II's most onerous requirements.[552] Forbearance offers the benefits of Title II without the need to apply telephone-specific rules.[553] McSherry argues:

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[550] Crawford, "Back to the Digital Drawing Board."
[551] Geddes, "Network Neutrality"; Geddes, "Geddes/PNSol - Broadband Market Evolution"; Dietz, "Should an 80 Year-Old Law Apply to the Internet?"; Solit, "Powell on C-SPAN Discussing Netflix, Net Neutrality, and Title II"; Brodkin, "Verizon Claims Common Carrier Rules Would Require Web Services to Pay ISPs."
[552] McSherry, "Forbearance."
[553] Open MIC, "Comment of Open Media and Information Companies Initiative (Open MIC), et Al Submitted before the Federal Communicaions Commission in the Matter of Proposed Rulemaking Promoting and Protecting the OPen Internet GN Docket No. 14-28."

> So while we call on the FCC to do the right and sensible thing and reclassify, we must simultaneously demand that the FCC explicitly reject any telecommunications regulations beyond specific and narrow prohibitions and requirements designed to create a fair and level playing field for innovation and user choice. Without broad forbearance, reclassification can become a nightmare for users, innovators and service providers alike.[554]

While FCC reclassification of broadband services is not highly likely in 2014, such an action would undoubtedly draw legal challenges from the major ISPs and create a protracted legal battle regarding the application of the 1996 Telecommunications Laws. Until the case was decided this would allow for de-facto common carriage online until the reclassification was either successfully challenged by network operators or a new telecommunications law is passed.

Recommendation 4: Incentivize network neutral practices

Policymakers should examine possible avenues for incentivizing network owners and operators to operate using network neutral practices and minimally invasive network management tools. Gilroy notes that incentives of this nature have been recently attempted in the US as recently as in 2009.[555] Network neutrality rules were included as requirements for grant recipients in two separate programs funded through the 2009 American Recovery and Reinvestment Act.[556] Future policy actions that might build on this practice include **offering tax incentives or rebates for network operators conducting sufficiently net neutral practices**. Similar incentives on the state and local level may also be effective, particularly in high-population areas like New York and California.

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[554] McSherry, "Forbearance."
[555] Gilroy, "Access to Broadband Networks," 336.
[556] Ibid., 335.

Recommendation 5: Encourage broadband separation or unbundling

Because of its unique regulatory history, the issue of common carriage and reclassification has been described as a uniquely "American problem."[557] The ubiquity of cable television along with telephone lines, both of which can serve as conduits for broadband traffic were leveraged by ISPs as rationale for shedding previous common carriage requirements.[558] In Europe, this hasn't been the case because households often only have access to a single broadband technology line and thus restrictions requiring unbundling or universal service access have remained.[559]As a measure to thwart the increasing reliance on only a few broadband providers, policymakers should consider **forced separation of infrastructure and ISP ownership.** While drastic, this separation would dissuade the conflicts-of-interest that may lead to anti-competitive, non-neutral treatment.

Similarly, Wu's "separations principle" would prohibit cross-ownership of CSPs, network ownership, or ISPs – while also prohibiting government interference or winner-choosing.[560] He argues the preservation of competitive information markets and the public's interest in the cultivation of the internet means regulators, led by the FCC, should play an active role in pursuing these ends.[561] Grove and Baumann argue layer

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[557] Marsden, *Net Neutrality*, 31.
[558] Stevenson and Clement, "Regulatory Lessons for Internet Traffic Management from Japan, the European Union, and the United States."
[559] Marsden, *Net Neutrality*, 31–34.
[560] Wu, *The Master Switch: The Rise and Fall of Information Empires*, 585.
[561] Ibid., 598–599.

separation would reduce inefficient investment by both ISPs and CSPs attempting to enter the other's business domains.[562]

Layer separations echoes the 1948 Supreme Court case *U.S. v. Paramount Pictures Inc.* in which the largest motion picture corporations (which owned content production, distribution and exhibition) were ordered to sell their interests in distribution and / or exhibition on the grounds that this level of ownership violated existing antitrust laws.[563] However, some have argued these "separations" approaches all rely on market forces, which alone may not provide the assurances needed for network neutrality.[564] Even the 1948 *Paramount* decision was thwarted by some studios, and eventually undermined by future deregulators.

The EU's network neutrality strategy has largely relied on a lighter version of this separations principle by encouraging the unbundling of ISPs from network infrastructure. Because of different infrastructures, business conditions and existing laws between European countries, these policies are an attempt to encourage broadband competition while disrupting existing structures as little as possible.

As legacy media technologies continue to migrate to a single Internet Protocol platform, there may be a renewed call for policies like unbundling. In part, the US's abandonment of common carrier regulation in the early 2000s was the availability of

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[562] Grove and Baumann, "Complexity in the Telecommunications Industry," 49.
[563] Holt, *Empires of Entertainment*, 2011, 94–100 Interestingly, the 1948 ruling did not explicitly ban vertical integration, but instead implemented a standard which required proof of anticompetitive "intent" to be found in order to prove vertical ownership was illegal. This standard was particularly relevant in the 1980s and 1990s as deregulation led to a rapid increase in media corporation mergers. .
[564] Morozov, "Passing Through"; Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*.

multi-platform competition between cable and DSL, but if no viable competitor emerges for increasingly-available FTTP connections, there may be a need to restore common carrier-like policies.

6.5 Neutrality for the future

There's an abundance of things to say about network neutrality, and this project has not claimed to say them all. Instead, it has offered an overview of the regulatory challenges and failures. The debate about NN is still ongoing. Rather than focusing in-depth on particular aspects of the issue, which has been thoroughly covered by Marsden, van Schewick, Crowcroft and others, this project instead has attempted to show the interactions and failures of multiple dimensions affecting NN.[565]

As this examination of network neutrality has underscored, the interactions between Lessig's four modalities are complex and deeply linked. Aspects of policy, architecture, markets, and norms have each played important roles in shaping the regulation of network neutrality. But as this project has hopefully shown, the role and power of those modalities is often fluid. Changing norms can lead to market power and the creation of new policies. Architectural choices cultivate communities to adopt certain norms and dismiss others. Policy decisions outline architectures that constrain markets, and so on.

6.5.1 Limitations and future projects

There are many opportunities to expand and enhance research from both this project and about network neutrality in general. For instance, more detailed examinations of each modality with regards to network neutrality could offer more insights into their role in

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[565] Marsden, *Net Neutrality*; Crowcroft, "Net Neutrality"; Van Schewick, *Towards an Economic Framework for Network Neutrality Regulation*; Hahn and Wallsten, "The Economics of Net Neutrality."

regulating this issue. In his book *Code* (2006), Lessig explores many of the architectural conditions and structures of cyberspace, but other examinations of markets, norms and policy would be beneficial to the scholarship.[566] Also, there is a need for additional network neutrality examinations that cross between the disciplines of law, engineering, media, sociology. Finally, this project examines and compares only four modalities, but as Lessig notes, there is room for other modalities of regulation and others could be argued for and analyzed.[567]

While this project offers case studies that show contrasts between the US approach to neutrality and approaches elsewhere in the world, there is a need for more case studies examining how the specific conditions of internet and information governance are addressed throughout the world. As more countries have adopted network neutrality rules, there is room for more empirical testing of the effects of these policies including, but not limited to, speed comparisons, public surveys, etc. Additional comparative research projects may examine the history or lack of neutrality over time, between invested parties, and the effects of neutrality policy elsewhere beyond the US and western world.

While network neutrality is a significant issue, it justifiably may receive far less attention in places where more basic resources are a priority. While network neutrality has been largely a concern for developed countries with widespread broadband access, its relevance to the digital divide and global communication access inequality should not be ignored.[568] As broadband access is increasingly available throughout the world, the standards and rules of access and cost tied to network neutrality may be particularly important. For this reason, future studies of broadband and internet expansion throughout the world (rich and poor) should include examining the inclusion or exclusion of neutrality policies and practices.

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[566] Lessig, *Code*.
[567] Lessig, "The New Chicago School."
[568] Noam, "Overcoming the Three Digital Divides."

6.5.2 An unknown future

Network neutrality is only one of the most recent battles in a much more long-term negotiation for how information is controlled and distributed. This legacy stretches as far back as civilization itself with control moving from one group to the next as culture, technology and needs change.[569] The emergence of globally interconnected digital networks and the increasing convergence of previous media forms onto one space has brought many economic, social and political changes and the effect of these changes on society continue to be negotiated. The regulation of network neutrality offers an insight into one relatively small aspect of the larger internet ecosystem with potentially big implications for how information is owned, created and distributed.

The regulation of an issue like network neutrality is not measured by specific policies, temporary economic relationships, inventive programming or fleeting beliefs, but by the culmination of these across time. The future of network neutrality remains unknown, but it is steered not by a single voice, idea, or event, but instead by the ongoing negotiation between multitudes of invested parties.

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[569] Mattelart, *The Information Society*; Innis, *Empire and Communications*.

REFERENCES

Adorno, Theodor, and Max Horkheimer. "The Culture Industry: Enlightenment as Mass Deception." In *Dialectic of Enlightenment*, translated by Andy Blunden, 1944. http://www.marxists.org/reference/archive/adorno/1944/culture-industry.htm.

"Alexa Top 500 Global Sites." *Alexa*. Accessed July 13, 2014. http://www.alexa.com/topsites.

American Civil Liberties Union. "What Is Net Neutrality?" *American Civil Liberties Union*. Accessed June 3, 2014. https://www.aclu.org/net-neutrality.

Ammori, Marvin. "Internet Freedom Day: This Year We Go to War for Net Neutrality." *Wired Opinion*, January 18, 2014. http://www.wired.com/opinion/2014/01/internet-freedom-day-year-net-neutrality/.

———. "We're About to Lose Net Neutrality — And the Internet as We Know It." *Wired Opinion*, November 4, 2013. http://www.wired.com/opinion/2013/11/so-the-internets-about-to-lose-its-net-neutrality/.

Anderson, Benedict. *Imagined Communities Reflections on the Origin and Spread of Nationalism*. London; New York: Verso, 2006.

Anderson, Chris, and Michael Wolff. "The Web Is Dead. Long Live the Internet." *Wired Magazine*, August 17, 2010. http://www.wired.com/magazine/2010/08/ff_webrip/.

Anderson, Nate. "Wireless Gets a Free Pass on Net Neutrality." *Ars Technica*, December 1, 2010. http://arstechnica.com/tech-policy/news/2010/12/throttle-away.ars.

AT&T. *2013 Annual Report*. AT&T Inc., 2013.

———. "AT&T REsponse to the European Commission Questionnaire for an EU Strategy for International Cooperation on ICT," 2007. http://ec.europa.eu/information_society/activities/.../at_t.pdf.

———. "AT&T to Acquire DIRECTV," May 18, 2014. http://about.att.com:80/content/snr/pressrelease/att_to_acquire_directv.html.

Atkinson, Robert D. "Economic Doctrines and Network Policy." *Telecommunications Policy* 35, no. 5 (June 2011): 413–25. doi:10.1016/j.telpol.2011.03.003.

Bagwell, Dana D. *An Open Internet for All : Free Speech and Network Neutrality*. El Paso: LFB Scholarly Pub. LLC, 2012.

Balogh, Stefanie. "Switkowski: Rollout of NBN Was Too Ambitious." *TheAustralian*, July 2, 2014. http://www.theaustralian.com.au/technology/switkowski-rollout-of-nbn-was-too-ambitious/story-e6frgakx-1226974307930.

Barlow, John Perry. "A Declaration of the Independence of Cyberspace," February 8, 1996. https://projects.eff.org/~barlow/Declaration-Final.html.

Beltrán, Fernando. "Using the Economics of Platforms to Understand the Broadband-Based Market Formation in the New Zealand Ultra-Fast Broadband Network." *Telecommunications Policy*, Special Issue: Papers from the 39th Research Conference on Communication, Information and Internet Policy (TPRC 2011), 36, no. 9 (October 2012): 724–35. doi:10.1016/j.telpol.2012.06.015.

Benkler, Yochai. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. New Haven [Conn.]: Yale University Press, 2006.

BEREC. *A View of Traffic Management and Other Practices Resulting in Restrictions to the Open Internet in Europe*. Brussels: Body of European Regulators for Electronic Communications, May 29, 2012.

———. *BEREC Publishes Net Neutrality Findings and New Guidance for Consultation*, May 29, 2012. http://berec.europa.eu/eng/document_register/subject_matter/berec/press_releases/24-berec-publishes-net-neutrality-findings-and-new-guidance-for-consultation.

Berners-Lee, Tim. "Long Live the Web: A Call for Continued Open Standards and Neutrality: Scientific American," November 22, 2010. http://www.scientificamerican.com/article.cfm?id=long-live-the-web.

———. "Net Neutrality: This Is Serious." Blog. *Decentralized Information Group (DIG) Breadcrumbs*, June 21, 2006. http://dig.csail.mit.edu/breadcrumbs/node/144.

Bilton, Nick. "Disruptions: Paying to Travel in the Internet's Fast Lanes." *Bits Blog*, February 2, 2014. http://bits.blogs.nytimes.com/2014/02/02/disruptions-paying-to-travel-in-the-internets-fast-lanes/.

Blevins, Jeffrey Layne, and Leslie Regan Shade. "Editorial: International Perspectives on Network Neutrality- Exploring the Politics of Internet Traffic Management and Policy Implications for Canada and the U.S." *Global Media Journal: Canadian Edition* 3, no. 1 (March 2010): 1–8.

Boadle, Anthony. "Brazilian Congress Passes Internet Bill of Rights: Google, Facebook to Comply." *The Sydney Morning Herald*, April 23, 2014. http://www.smh.com.au/it-pro/government-it/brazilian-congress-passes-internet-bill-of-rights-google-facebook-to-comply-20140423-zqy4x.html.

Boliek, Babette E. L. “Fcc Regulation Versus Antitrust How Net Neutrality Is Defining the Boundaries.” *Boston College Law Review* 52, no. 5 (November 2011): 1627–86.

Boyko, Brian. “The Morality of Neutrality: Philosophy with Richard Stallman.” *Service Assurance Daily*, May 6, 2008. http://www.serviceassurancedaily.com/2008/05/the-morality-of-neutrality-philosophy-with-richard-stallman/.

Braman, Sandra. *Change of State: Information, Policy, and Power*. Cambridge, Mass.: MIT Press, 2006.

Braue, David. “Broadband Is Not a Utility, nor Is the NBN. Discuss.” *ZDNet*, May 19, 2014. http://www.zdnet.com/broadband-is-not-a-utility-nor-is-the-nbn-discuss-7000029592/.

Bright, Peter. “Verizon Could Be Throttling Netflix and Amazon, but There’s No Actual Evidence of It.” *Ars Technica*, February 6, 2014. http://arstechnica.com/information-technology/2014/02/verizon-could-be-throttling-netflix-and-amazon-but-theres-no-actual-evidence-of-it/.

Broache, Anne. “Obama Pledges Net Neutrality Laws If Elected President.” *CNET*, October 29, 2007. http://news.cnet.com/8301-10784_3-9806707-7.html.

Brodkin, Jon. “AT&T Plan to Turn Data Caps into More Cash Could Come to Home Internet.” *Ars Technica*, January 9, 2014. http://arstechnica.com/tech-policy/2014/01/att-plan-to-turn-data-caps-into-more-cash-could-come-to-home-internet/.

———. “How Comcast Became a Powerful—and Controversial—part of the Internet Backbone.” *Ars Technica*, July 17, 2014. http://arstechnica.com/information-technology/2014/07/how-comcast-became-a-powerful-and-controversial-part-of-the-internet-backbone/.

———. “Make ISPs into ‘Common Carriers,’ Says Former FCC Commissioner.” *Ars Technica*, January 24, 2014. http://arstechnica.com/tech-policy/2014/01/drop-regulatory-hammer-on-internet-providers-says-former-fcc-commish/.

———. “Netflix Packets Being Dropped Every Day Because Verizon Wants More Money.” *Ars Technica*, February 21, 2014. http://arstechnica.com/information-technology/2014/02/netflix-packets-being-dropped-every-day-because-verizon-wants-more-money/.

———. “Obama on Net Neutrality: I Wouldn’t Be President without an Open Internet.” *Ars Technica*, January 31, 2014. http://arstechnica.com/tech-policy/2014/01/obama-on-net-neutrality-i-wouldnt-be-president-without-an-open-internet/.

———. “Report: Verizon FiOS Claimed Public Utility Status to Get Government Perks.” *Ars Technica*, May 28, 2014. http://arstechnica.com/tech-policy/2014/05/report-verizon-fios-gets-perks-from-government-while-avoiding-regulations/.

———. “Verizon Claims Common Carrier Rules Would Require Web Services to Pay ISPs.” *Ars Technica*, July 16, 2014. http://arstechnica.com/tech-policy/2014/07/verizon-claims-common-carrier-rules-would-require-web-services-to-pay-isp/.

———. “Why Verizon Won’t Solve Its Netflix Problem as Soon as Comcast.” *Ars Technica*, June 11, 2014. http://arstechnica.com/information-technology/2014/06/why-verizon-wont-solve-its-netflix-problem-as-soon-as-comcast/.

Brousseau, Eric, Meryem Marzouki, and Cécile Méadel. “Introduction - Governance, Networks and Digital Technologies: Societal, Political and Organizational Innovations.” In *Governance, Regulations and Powers on the Internet*. Cambridge ; New York: Cambridge University Press, 2012.

Brown, Ian, and Christopher T. Marsden. *Regulating Code: Good Governance and Better Regulation in the Information Age*. Information Revolution and Global Politics. Cambridge, Mass: The MIT Press, 2013.

Burstein, Aaron J., and Fred B. Schneider. “Trustworthiness as a Limitation on Network Neutrality.” *Federal Communications Law Journal*, no. 3 (2008): 591.

Carp, Jeremy, Isabella Kulkarni, and Patrick Schmidt. “Transparency, Consumers, and the Pursuit of an Open Internet: A Critical Appraisal.” In *Regulating the Web: Network Neutrality and the Fate of the Open Internet*, edited by Zachary Stiegler. Lanham: Lexington Books, 2013.

Carr, David. “In Modern Media Realm, Big Mergers Are a Bulwark Against Rivals - NYTimes.com.” *The New York Times*, July 16, 2014. http://www.nytimes.com/2014/07/17/business/media/in-modern-media-realm-big-mergers-are-a-bulwark-against-rivals.html?nytmobile=0.

Carter, Kenneth R., J. Scott Marcus, Adam J. Peake, and Tomoaki Watanabe. “A Comparison of Network Neutrality Approaches in: The US, Japan, and the European Union.” In *38th Annual Telecommunication Policy Research Conf). Washington, DC. Consultado En Http://kennethrcarter. com/vita/pubs/Net_Neutrality_in_US_ JP_EU. Pdf*, 2010. http://www.globalcityinfo.org/upload/files/1389076852828.pdf.

Castells, Manuel. *Communication Power*. Oxford; New York: Oxford University Press, 2009.

———. *The Internet Galaxy: Reflections on the Internet, Business, and Society*. Oxford ; New York: Oxford University Press, 2001.

Cave, Martin, and Pietro Crocioni. "Does Europe Need Network Neutrality Rules?" *International Journal of Communication* 1, no. 1 (2007): 11.

Center for Applied Internet Data Analysis. "AS Rank: AS Ranking." *CAIDA AS Ranking*. Accessed August 7, 2014. http://as-rank.caida.org/?mode0=as-ranking.

Cerf, Vinton. "'Father of the Internet': Why We Must Fight for Its Freedom." *CNN*, November 30, 2012. http://edition.cnn.com/2012/11/29/business/opinion-cerf-google-internet-freedom/index.html.

———. "The Open Internet: What It Is, and Why It Matters." *Telecommunications Journal of Australia* 59, no. 2 (2009).

Cheng, Hsing Kenneth, Subhajyoti Bandyopadhyay, and Hong Guo. "The Debate on Net Neutrality: A Policy Perspective." *Information Systems Research* 22, no. 1 (March 2011): 60–82. doi:10.1287/isre.1090.0257.

Choi, Jay pil, and Byung-Cheol Kim. "Net Neutrality and Investment Incentives." *RAND Journal of Economics (Wiley-Blackwell)* 41, no. 3 (September 2010): 446–71. doi:10.1111/j.1756-2171.2010.00107.x.

Clark, David D. "Network Neutrality: Words of Power and 800-Pound Gorillas." *International Journal of Communication* 1, no. 1 (August 9, 2007): 8.

Clark, Liat. "UK Gov Wants 'Unsavoury' Web Content Censored." *Wired UK*, March 15, 2014. http://www.wired.co.uk/news/archive/2014-03/15/government-web-censorship.

Coase, R. H. "The Federal Communications Commission." *Journal of Law and Economics* 2 (October 1, 1959): 1–40.

Cohn, Cindy. "A Review of Verizon and Google's Net Neutrality Proposal | Electronic Frontier Foundation." Blog. *Deeplinks Blog*, August 10, 2010. https://www.eff.org/deeplinks/2010/08/google-verizon-netneutrality.

Coleman, Jules L. *Markets, Morals, and the Law*. Oxford ; New York: Oxford University Press, 1998.

Comast Corporation. *Comcast 2013 Annual Report*. US Securities and Exchange Comission Form 10-K, February 12, 2014. http://files.shareholder.com/downloads/CMCSA/3232554713x0xS1193125%2D14%2D47522/1166691/filing.pdf.

Communciations Committee. *Broadband Access in the EU: Situation at 1 July 2013*. Brussels: European Commission, March 25, 2014.

Cowhey, Peter F, Jonathan David Aronson, and Donald Abelson. *Transforming Global Information and Communication Markets the Political Economy of Innovation*. Cambridge, Mass.: MIT Press, 2009. http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=259237.

Cramer, Benjamin W. "The Two Internet Freedoms: Framing Victimhood for Political Gain." *International Journal of Communication (19328036)* 7 (January 2013): 1074–93.

Crawford, Susan. "Back to the Digital Drawing Board." *The New York Times*, January 16, 2014. http://www.nytimes.com/2014/01/17/opinion/back-to-the-digital-drawing-board.html.

———. "Response to Harold Furchtgott-Roth." *Fed. Comm. LJ* 65 (2013): 333–333.

———. "Why Net Neutrality Matters to You - Susan Crawford." *Newsday*, January 15, 2014. http://www.newsday.com/opinion/oped/crawford-why-net-neutrality-matters-to-you-1.6807160.

Crawford, Susan P. *Captive Audience: The Telecom Industry and Monopoly Power in the New Gilded Age*. Yale University Press, 2013.

Crawford, Susan, and Mitchell Shapiro. "Capex&Revenue_2001-2013 - Google Sheets." *Google Document*. Accessed August 17, 2014. https://docs.google.com/spreadsheets/d/1ghABIM9paKNPI5avCHwLiTJRBiVwBp7tRrpcrrchq10/edit?pli=1#gid=1758281064.

Cringely, Robert X. "Net Neutrality Is Dead, but It Probably Doesn't Matter." Blog. *I, Cringely*, February 21, 2014. http://www.cringely.com/2014/01/21/net-neutrality-dead-probably-doesnt-matter/.

Crocioni, Pietro. "Net Neutrality in Europe: Desperately Seeking a Market Failure." *Telecommunications Policy* 35, no. 1 (February 2011): 1–11. doi:10.1016/j.telpol.2010.12.007.

Croteau, David, and William Hoynes. *The Business of Media: Corporate Media and the Public Interest*. 2nd ed. Thousand Oaks, Calif: Pine Forge Press, 2006.

Crowcroft, J. "Net Neutrality: The Technical Side of the Debate: A White Paper." *ACM SIGCOMM COMPUTER COMMUNICATION REVIEW* 37, no. 1 (January 2007): 49–55.

Cunningham, Stuart, and Jon Silver. *Screen Distribution*. Palgrave Pivot. Palgrave Macmillan, 2014.

Davidson, Alan. "Vint Cerf Speaks out on Net Neutrality." *Google Official Blog*, November 8, 2005. http://googleblog.blogspot.com/2005/11/vint-cerf-speaks-out-on-net-neutrality.html.

De Sola Pool, Ithiel. *Technologies of Freedom*. Cambridge, Mass.: Belknap Press, 1983.

———. "The Rise of Communications Policy Research." *Journal of Communication* 24, no. 2 (June 1, 1974): 31–42. doi:10.1111/j.1460-2466.1974.tb00366.x.

Dietz, Brian. "Should an 80 Year-Old Law Apply to the Internet?" *NCTA - Cable Tech Talk*, June 14, 2014. https://www.ncta.com/platform/broadband-internet/should-an-80-year-old-law-apply-to-the-internet/.

Dijck, José van. *The Culture of Connectivity: A Critical History of Social Media*. Oxford; New York: Oxford University Press, 2013.

Downes, Larry. "Why Is the UN Trying to Take over the Internet? - Forbes." *Forbes*, August 9, 2012. http://www.forbes.com/sites/larrydownes/2012/08/09/why-the-un-is-trying-to-take-over-the-internet/.

Drutman, Lee, and Zander Furnas. "How Telecoms and Cable Have Dominated Net Neutrality Lobbying." *The Sunlight Foundation*, May 16, 2014. https://sunlightfoundation.com/blog/2014/05/16/how-telecoms-and-cable-have-dominated-net-neutrality-lobbying/.

Durie, John. "Morrow Quick to Warn of NBN Fragility." *TheAustralian*, June 30, 2014. http://www.theaustralian.com.au/business/opinion/morrow-quick-to-warn-of-nbn-fragility/story-e6frg9io-1226972196573.

Economides, Nicholas, and Joacim Tåg. "Network Neutrality on the Internet: A Two-Sided Market Analysis." *Information Economics and Policy* 24, no. 2 (June 2012): 91–104. doi:10.1016/j.infoecopol.2012.01.001.

Eggerton, John. "Latta Bill Would Block Title II." *Broadcasting & Cable*, May 29, 2014. http://www.broadcastingcable.com/news/washington/latta-bill-would-block-title-ii/131451.

Eli M. Noam. "Regulation 3.0 for Telecom 3.0." *Telecommunications Policy* 34 (2009): 4–10. doi:10.1016/j.telpol.2009.11.004.

Epstein, Richard A. "What Broadcast Licenses Tell Us about Net Neutrality: Cosmopolitan Broadcasting Corporation v. FCC." In *New Directions in*

Communications Policy, edited by Randolph J. May. Durham, N.C: Carolina Academic Press, 2009.

European Commission. *Implementation of the EU Regulatory Framework for Electronic Communicaitons - 2014*. Brussels: European Commission, July 14, 2014.

———. "The Open Internet and Net Neutrality in Europe. Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions." European Commission, April 2, 2011. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0222:FIN:EN:PDF.

Farivar, Cyrus. "The UN's Telecom Conference Is Finally Over. Who Won? Nobody Knows." *Ars Technica*, December 14, 2012. http://arstechnica.com/tech-policy/2012/12/the-uns-telecom-conference-is-finally-over-who-won-nobody-knows/.

FCC. *2014 Measuring Broadband America Fixed Broadband Report: A Report on Consumer Fixed Broadband Performance in the US*. Washington, DC: Federal Communications Commission, 2014.

FCC Panel. *Ensuring Competition on the Internet :net Neutrality and Antitrust. Pt. II*. Washington : U.S. G.P.O., 2011., 2011.

Federal Communications Commission. "Chairman Statement on Broadband Consumers and Internet Congestion," June 13, 2014. http://www.fcc.gov/document/chairman-statement-broadband-consumers-and-internet-congestion.

———. *Eighth Broadband Progress Report*. Washington, DC, August 12, 2012. http://www.fcc.gov/reports/eighth-broadband-progress-report.

———. "FCC Classifies Cable Modem Service as 'Information Service': Initiates Proceeding to Promote Broadband Deployment and Examine Regulatory Implications of Classification," March 14, 2002. http://transition.fcc.gov/Bureaus/Cable/News_Releases/2002/nrcb0201.html.

———. *In the Matter of Preserving the Open Internet Broadband Industry Practices*. Report and Order. Washington, DC: Federal Communications Commission, December 23, 2010. https://apps.fcc.gov/edocs_public/attachmatch/FCC-10-201A1_Rcd.pdf.

———. "Internet Access Services: Status as of December 31, 2012." Federal Communications Commission, December 2013. http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db1224/DOC-324884A1.pdf.

———. “Policy Statement.” Federal Communications Commission, September 23, 2005. FCC 05-151. http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.pdf.

———. *Report and Order In the Matter of Preserving the Open Internet Broadband Industry Practices*. Washington, DC: Federal Communications Commission, December 23, 2010.

Feld, Harold. “An Examination of the Economics of Whitacre Tiering.” *Wetmachine*, March 27, 2006. http://www.wetmachine.com/tales-of-the-sausage-factory/an-examination-of-the-economics-of-whitacre-tiering/.

———. “Of CDNs, Netflix, Net Neutrality, and Cable Fu#$@!ery.” *Wetmachine*, June 25, 2014. http://www.wetmachine.com/tales-of-the-sausage-factory/of-cdns-netflix-net-neutrality-and-cable-fuery/.

Felton, Benoit. “An Attempt at Clarifying the Net Neutrality Debate.” *Technically Speaking*, June 6, 2014. http://blog.advaoptical.com/an-attempt-at-clarifying-the-net-neutrality-debate/.

Finley, Klint. “Democrats Aim to Reinstate Network Neutrality With New Bill.” *WIRED*, June 17, 2014. http://www.wired.com/2014/06/democrats-bill/.

Freedman, Des. “Outsourcing Internet Regulation.” In *Misunderstanding the Internet*, edited by James Curran and Natalie Fenton. Communication and Society. London New York: Routledge, 2012.

Frieden, Rob. “Contamination of the Common Carrier Concept in Telecommunications.” *Telecommunications Policy* 19, no. 9 (December 1995): 685–97. doi:10.1016/0308-5961(95)00047-X.

Frischmann, Brett M., and Barbara Van Schewick. “Network Neutrality and the Economics of an Information Superhighway: A Reply to Professor Yoo.” *Jurimetrics*, 2007, 383–428.

Froehlich, Andrew. “Net Neutrality Retreat Threatens Cloud Growth.” *Network Computing*, June 23, 2014. http://www.networkcomputing.com/cloud-infrastructure/net-neutrality-retreat-threatens-cloud-growth/a/d-id/1278756.

Fung, Brian. “Democrats Unveil Legislation Forcing the FCC to Ban Internet Fast Lanes.” *Washington Post*, June 17, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/06/17/this-new-bill-would-force-the-fcc-to-ban-internet-fast-lanes/.

———. “FCC Chair: An Internet Fast Lane Would Be ‘Commercially Unreasonable,’” May 20, 2014.

http://www.washingtonpost.com/posttv/business/technology/why-net-neutrality-matters/2014/01/16/b3fe69dc-7f02-11e3-93c1-0e888170b723_video.html.

———. “ISPs Are Spending Less on Their Networks as They Make More Money off Them.” *The Washington Post*, July 24, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/07/24/isps-are-spending-less-on-their-networks-as-they-make-more-money-off-them/.

———. “Net Neutrality Protesters Are Literally Camped Outside the FCC. And the Agency Is Hearing Them Out.” *The Washington Post*, May 13, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/05/13/net-neutrality-protesters-are-literally-camped-outside-the-fcc-and-the-agency-is-hearing-them-out/.

———. “The FCC Is Going to Scrutinize Netflix’s Deals with Comcast, Verizon — and Others, Too.” *Washington Post*, June 13, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/06/13/the-fcc-is-going-to-scrutinize-netflixs-deals-with-comcast-verizon-and-others-too/.

———. “The FCC May Consider a Stricter Definition of Broadband in the Netflix Age.” *Washington Post*, May 30, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/05/30/the-fcc-may-consider-a-stricter-definition-of-broadband-in-the-netflix-age/.

———. “This Practically Ancient Internet Technology Supports Speeds 1,000 Times the National Average.” *The Washington Post*, July 10, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/07/10/this-practically-ancient-internet-technology-supports-speeds-1000-times-the-national-average/.

———. “Verizon Denies Using Net Neutrality Victory to Sabotage Netflix, Amazon.” *Washington Post*, February 5, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/02/05/verizon-denies-using-net-neutrality-victory-to-sabotage-netflix-amazon/.

———. “What to Make of Obama’s Tepid Response on Net Neutrality.” *Washington Post*. Accessed May 17, 2014. http://www.washingtonpost.com/blogs/the-switch/wp/2014/05/17/what-to-make-of-obamas-tepid-response-on-net-neutrality/.

Geddes, Martin. “Geddes/PNSol - Broadband Market Evolution.” 14:23:38 UTC. http://www.slideshare.net/mgeddes/geddespnsol-broadband-market-evolution.

———. “Network Neutrality: Nasty or Nice?” *Geddes*. Accessed June 6, 2014. http://www.martingeddes.com/think-tank/network-neutrality-nasty-nice/.

———. “Would the Real Network Neutrality Please Stand Up?,” November 15, 2005. http://www.circleid.com/posts/877/.

Genachowski, Julius. “Preserving a Free and Open Internet: A Platform for Innovation, Opportunity, and Prosperity.” Prepared remarks, The Brookings Institution, Washington, DC, September 21, 2009. http://www.fcc.gov/document/prepared-remarks-chairman-julius-genachowski-preserving-free-and-open-internet-platform-inn.

Gerrand, Peter. “Will Our National Broadband Network Support Network Neutrality and Avoid Internet Censorship.” *Telecommunications Journal of Australia* 59, no. 2 (2009).

Gillespie, Tarleton L. *The Politics of “Platforms.”* SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, May 1, 2010. http://papers.ssrn.com/abstract=1601487.

Gillula, Jeremy, and April Glaser. “Net Neutrality Will Require Us to Shine the Light on Internet Providers.” *Electronic Frontier Foundation*, June 18, 2014. https://www.eff.org/deeplinks/2014/06/net-neutrality-will-require-us-shine-light-internet-providers.

Gilroy, Angele A. “Access to Broadband Networks: The Net Neutrality Debate.” *Journal of Current Issues in Media & Telecommunications* 5, no. 4 (November 2013): 331–51.

Gladsone, Brooke. “Net Neutrality and You.” *On The Media*. WNYC, January 17, 2014. http://www.onthemedia.org/story/end-net-neutrality/transcript/.

Goldsmith, Jack L, and Tim Wu. *Who Controls the Internet?: Illusions of a Borderless World*. New York: Oxford University Press, 2008.

Goldstein, Gordon M. “The End of the Internet?” *The Atlantic*, June 25, 2014. http://www.theatlantic.com/magazine/archive/2014/07/the-end-of-the-internet/372301/.

Gross, Grant. “Study: Net Neutrality Policies Vary in EU Countries.” *PCWorld*, September 16, 2013. http://www.pcworld.com/article/2048856/study-net-neutrality-policies-vary-in-eu-countries.html.

———. “Who Really Was Behind the SOPA Protests?” *PCWorld*, February 3, 2012. http://www.pcworld.com/article/249270/who_really_was_behind_the_sopa_protests.html.

Grove, Nico, and Oliver Baumann. "Complexity in the Telecommunications Industry: When Integrating Infrastructure and Services Backfires." *Telecommunications Policy* 36, no. 1 (February 2012): 40–50. doi:10.1016/j.telpol.2011.11.019.

"Grumpy Cat® - The World's Grumpiest Cat!" Accessed July 15, 2014. http://www.grumpycats.com/.

Guniganti, Pallavi, and Grabowski. "Applying Common Carriage to Network Neutrality in the United States." In *Regulating the Web: Network Neutrality and the Fate of the Open Internet*, edited by Zachary Stiegler. Lanham: Lexington Books, 2013.

Gustin, Sam. "The FCC Was Hacked After John Oliver Called for Net Neutrality Trolls." *Motherboard*, June 10, 2014. http://motherboard.vice.com/read/the-fcc-was-hacked-after-john-olivers-call-for-net-neutrality-trolls.

Hahn, Robert W., and Scott Wallsten. "The Economics of Net Neutrality." *The Economists' Voice* 3, no. 6 (2006). http://works.bepress.com/scott_wallsten/3.

Halliday, Josh. "Net Neutrality Is 'Big Issue', Says Internet Society Chief." Blog. *The Guardian*, September 27, 2010. http://www.guardian.co.uk/technology/blog/2010/sep/27/internet-society-net-neutrality.

Hass, Douglas A. "The Never-Was-Neutral Net and Why Informed End Users Can End the Net Neutrality Debates." *Berkeley Technology Law Journal* 22, no. 4 (Fall 2007): 1565–1635.

Hattem, Julian. "Franken: Net neutrality is 'First Amendment issue of our time.'" Text. *TheHill*, July 8, 2014. http://thehill.com/policy/technology/211607-franken-net-neutrality-is-first-amendment-issue-of-our-time.

Herrman, John. "Welcome To The Net Neutrality Nightmare Scenario." *BuzzFeed*, January 14, 2014. http://www.buzzfeed.com/jwherrman/welcome-to-the-net-neutrality-nightmare-scenario.

Higginbotham, Stacey. "Broadband Shouldn't Be like Cable TV. Why Consumers Should Care about Peering.," June 7, 2014. http://gigaom.com/2014/06/07/broadband-shouldnt-be-like-cable-tv-why-consumers-should-care-about-peering/.

Hilmes, Michele. *Hollywood and Broadcasting: From Radio to Cable*. Illinois Studies in Communications. Urbana: University of Illinois Press, 1990.

Holt, Jennifer. *Empires of Entertainment: Media Industries and the Politics of Deregulation, 1980-1996*. New Brunswick, N.J: Rutgers University Press, 2011.

———. *Empires of Entertainment: Media Industries and the Politics of Deregulation, 1980-1996*. Rutgers University Press, 2011.

———. "Regulating Connected Viewing: Media Pipelines and Cloud Policy." In *Connected Viewing: Selling, Streaming, & Sharing Media in the Digital Era*, edited by Kevin Sanson and Holt, Jennifer. New York ; London: Routledge, 2014.

Howard, Philip N., and Muzammil M. Hussain. "THe Role of Digital Media." *Journal of Democracy* 22, no. 3 (2011): 35–48.

Howell, Bronwyn. "Broadband Regulation and Government Investment in Nationwide UltraFast Fibre Broadband Networks: Evidence from New Zealand." presented at the European Regional Conference of hte International Telecommunications Soceity, Florence, Itally, October 2013.

Hu, Elise. "A Fascinating Look Inside Those 1.1 Million Open-Internet Comments." *NPR.org*, August 12, 2014. http://www.npr.org/blogs/alltechconsidered/2014/08/12/339710293/a-fascinating-look-inside-those-1-1-million-open-internet-comments.

———. "John Oliver Helps Rally 45,000 Net Neutrality Comments To FCC." *NPR.org*, June 3, 2014. http://www.npr.org/blogs/alltechconsidered/2014/06/03/318458496/john-oliver-helps-rally-45-000-net-neutrality-comments-to-fcc.

Ingram, Mathew. "Is Net Neutrality Dying? Has the FCC Killed It? What Comes next? Here's What You Need to Know," April 24, 2014. http://gigaom.com/2014/04/24/is-net-neutrality-dying-has-the-fcc-killed-it-what-comes-next-heres-what-you-need-to-know/.

Innis, Harold Adams. *Empire and Communications*. Toronto: Dundurn Press, 2007.

"Interconnection Confusion | Commentary." *Roll Call*. Accessed June 19, 2014. http://www.rollcall.com/news/interconnection_confusion_commentary-232956-1.html?pg=2&dczone=opinion.

Internet Society. "Brief History of the Internet - Internet Timeline." Accessed July 2, 2014. http://www.internetsociety.org/internet/what-internet/history-internet/brief-history-internet.

———. *Comments on Draft Guidelines on Net Neutrality for the Body of European Regulators for Electronic Communications*, October 3, 2011. http://www.internetsociety.org/comments-draft-guidelines-net-neutrality-body-european-regulators-electronic-communications.

———. “Net Neutrality - Internet Issues.” *Net Neutrality*. Accessed November 13, 2012. http://www.internetsociety.org/net-neutrality.

Isenberg, David S. “The Dawn of the Stupid Network.” *ACM Networker* 2, no. 1 (March 1998): 24–31.

ITU. *The State of Broadband 2013: Universalizing Broadband*. Geneva, Switzerland: International Telecommunications Union and United Nations Educational, Scientific and Cultural Organization, September 2013.

Jančařík, Jonáš, and Ana Mingo Jaramillo. “Net Neutrality in the EU: The Devil Is in the Loopholes.” *European Public Affairs*, February 5, 2014. http://www.europeanpublicaffairs.eu/net-neutrality-in-the-eu-the-devil-is-in-the-loopholes/.

Jenkins, Henry. *Convergence Culture: Where Old and New Media Collide*. New York, N.Y., [etc.]; New York Universtiy Press, 2008.

Jones, William. “The Common Carrier Concept as Applied to Telecommunications: A Historical Perspective.” Submitted to the Federal Communications Commission as Appendix to the Reply Comments of International Business Machines Corporation in Competitive Carriers Rulemaking CC Docket No. 79-252, January 11, 1982. http://www.cybertelecom.org/notes/jones.htm.

Kafka, Peter. “Google, Verizon Announce a Cake-Having, Eating ‘Policy.’ But It’s Not a ‘Business Arrangement.’” *AllThingsD*, August 9, 2010. http://allthingsd.com/20100809/live-google-verizon-talk-policy/.

———. “Netflix Is Chasing HBO, but It’s Already Passed Plenty of Big Cable Guys.” *Re/code*, February 26, 2014. http://recode.net/2014/02/26/netflix-is-chasing-hbo-but-its-already-passed-plenty-of-big-cable-guys/.

———. “What’s Net Neutrality? What Happened to Net Neutrality Yesterday? What Happens Next? A Q&A for the Rest of Us.” *Re/code*, January 15, 2014. http://recode.net/2014/01/15/whats-net-neutrality-what-happened-to-net-neutrality-yesterday-what-happens-next-a-qa-for-the-rest-of-us/.

Kellner, Douglas. “Media Industries, Political Economy, and Media/Cultural Studies: An Articulation.” In *Media Industries: History, Theory, and Method*, edited by Jennifer Holt and Alisa Perren. Chichester, West Sussex ; Malden, MA: Wiley-Blackwell, 2009.

Kelty, Christopher M. “From Participation to Power.” In *The Particapatory Cultures Handbook*, edited by Aaron Delwiche and Jennifer Jacobs Henderson, 23–31. Routledge, 2012.

———. *Two Bits: The Cultural Significance of Free Software*. Experimental Futures. Durham: Duke University Press, 2008.

Kimball, Danny. "Net Neutrality Is Over— Unless You Want It | Antenna." Antenna, January 17, 2014. http://blog.commarts.wisc.edu/2014/01/17/net-neutrality-is-over-unless-you-want-it/.

———. "What We Talk about When We Talk about Net Neutrality: A Historical Genealogy of the Discourse of 'Net Neutrality.'" In *Regulating the Web: Network Neutrality and the Fate of the Open Internet*, edited by Zachary Stiegler. Lanham: Lexington Books, 2013.

Kirwin, Joe. "EU Member States Remain Divided Over Net Neutrality, Mobile Fees, Spectrum Policy." *Bloomberg BNA*, June 6, 2014. http://www.bna.com/eu-member-states-n17179891197/.

Knapp, Julie, and Walter Johnston. "Internet Traffic Exchange: Time to Look under the Hood." *FCC.gov*, June 18, 2014. http://www.fcc.gov/blog/internet-traffic-exchange-time-look-under-hood.

Koebler, Jason. "The FCC Can't Help Cities Trapped By Predatory Internet Deals With Big Telecom | Motherboard." *Motherboard*, June 13, 2014. http://motherboard.vice.com/read/the-fcc-cant-help-cities-trapped-by-predatory-internet-deals-with-big-telecom.

Krämer, Jan, Lukas Wiewiorra, and Christof Weinhardt. "Net Neutrality: A Progress Report." *Telecommunications Policy*, no. 0 (2013). doi:10.1016/j.telpol.2012.08.005.

Kuruma, Samezo. *History of Political Economy*. Translated by Michael Schauerte. Tokyo: Iwanami Shoten, 1954.

Last Week Tonight with John Oliver: Net Neutrality. YouTube. HBO, 2014. http://www.youtube.com/watch?v=fpbOEoRrHyU&feature=youtube_gdata_player.

Latham, Robert. "Networks, Information, and the Rise of the Global Internet." In *Digital Formations: IT and New Architectures in the Global Realm*, edited by Saskia Sassen and Robert Lantham. Princeton, N.J: Princeton University Press, 2005.

Lawler, Richard. "No, Netflix's Deal with Comcast Won't Destroy the Internet." *Engadget*, February 24, 2014. http://www.engadget.com/2014/02/24/netflix-comcast/.

Lee, Daeho, and Hongbum Kim. "The Effects of Network Neutrality on the Diffusion of New Internet Application Services." *Telematics and Informatics* 31, no. 3 (August 2014): 386–96. doi:10.1016/j.tele.2013.10.001.

Lee, Robin S, and Tim Wu. "Subsidizing Creativity through Network Design: Zero-Pricing and Net Neutrality." *Journal of Economic Perspectives* 23, no. 3 (August 2009): 61–76. doi:10.1257/jep.23.3.61.

Lehr, William H., and John M. Chapin. "On the Convergence of Wired and Wireless Access Network Architectures." *Information Economics and Policy* 22 (2009): 33–41. doi:10.1016/j.infoecopol.2009.12.006.

Leigh, David, and Luke Harding. *Wikileaks: Inside Julian Assange's War on Secrecy*. 1st ed. New York: Public Affairs, 2011.

Lemley, Mark A., and Lawrence Lessig. "The End of End-to-End: Preserving the Architecture of the Internet in the Broadband Era." *SSRN eLibrary*, October 1, 2000. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=247737.

Lessig, L. "The Law of the Horse: What Cyberlaw Might Teach." *Harvard Law Review* 113, no. 2 (1999): 501–49.

Lessig, Lawrence. *Code: Version 2.0*. 2nd ed. New York: Basic Books, 2006.

———. "In Support of Network Neutrality." *I/S: A Journal of Law and Policy for the Information Society* 3 (2008 2007): 185.

———. "The New Chicago School." *The Journal of Legal Studies* 27, no. S2 (June 1, 1998): 661–91. doi:10.1086/jls.1998.27.issue-s2.

Levy. "Big Net Neutrality Win in Europe." *Free Press*, April 3, 2014. http://www.freepress.net/blog/2014/04/03/big-net-neutrality-win-europe.

Lieberman, David. "Will Cable Ops Take On Netflix Following Court Upset Of Net Neutrality Rules?" *Deadline.com*, January 15, 2014. http://www.deadline.com/2014/01/will-cable-ops-take-on-netflix-following-court-upset-of-net-neutrality-rules/.

Lijphart, Arend. "Comparative Politics and the Comparative Method." *The American Political Science Review* 65, no. 3 (September 1, 1971): 682–93. doi:10.2307/1955513.

Lobato, Ramon. *Shadow Economies of Cinema: Mapping Informal Film Distribution*. London: Palgrave Macmillan [on behalf of the] BFI, 2012.

Lohman, Tim. "CeBIT 2010: Google Renews Net Neutrality Call | Network World." *Computerworld Australia*, May 26, 2010. http://www.networkworld.com/article/2210444/software/cebit-2010--google-renews-net-neutrality-call.html.

Lotz, Amanda D. *The Television Will Be Revolutionized*. New York: New York University Press, 2007.

Lyons, Daniel. “Comcast, Netflix, and the Unregulated Interconnection Market.” *Tech Policy Daily*, April 8, 2014. http://www.techpolicydaily.com/communications/comcast-netflix-unregulated-interconnection-market/.

Ma, Richard T. B., and Vishal Misra. “The Public Option: A Nonregulatory Alternative to Network Neutrality.” *IEEE/ACM Transactions on Networking* 21, no. 6 (December 2013): 1866.

Maathuis, I, and W.A Smit. “The Battle between Standards: TCP/IP Vs OSI Victory through Path Dependency or by Quality?” In *The 3rd Conference on Standardization and Innovation in Information Technology, 2003*, 161–76, 2003. doi:10.1109/SIIT.2003.1251205.

MacKinnon, Rebecca. *Consent of the Networked: The World-Wide Struggle for Internet Freedom*. New York: Basic Books, 2012.

Manwaring, Kayleen. “Network Neutrality: Issues for Australia.” *Computer Law and Security Review: The International Journal of Technology and Practice* 26 (January 1, 2010): 630–39. doi:10.1016/j.clsr.2010.09.004.

Marcus, J. S., P. Nooren, J. Cave, and K. R. Carter. “Network Neutrality: Challenges and Responses in the EU and in the US.” *A Study for the European Parliament*, 2011.

Markoff, John. “The Team That Put the Net in Orbit.” *The New York Times*, December 9, 2007, sec. Business. http://www.nytimes.com/2007/12/09/business/09stream.html.

Marsden, Christopher. “Network Neutrality: History, Regulation and Future.” *Cerrillo-Martínez, Agustí et Al. Net Neutrality and Other Challenges for the Future of the Internet. Barcelona: Huygens*, 2011, 29–49.

Marsden, Christopher T. *Net Neutrality: Towards a Co-Regulatory Solution.* New York; Gordonsville: Bloomsbury Publishing Macmillan [Distributor], 2010.

Marsden, Christopher T., ed. “Introduction: Information and Communications Technologies, Globalisation and Regulation.” In *Regulating the Global Information Society*. Warwick Studies in Globalisation. London ; New York: Routledge, 2000.

———. “Net Neutrality in Europe: What Prospects for Net Neutrality in Europe?” *Net Neutrality in Europe*, January 18, 2014. http://chrismarsden.blogspot.com/2014/01/what-prospects-for-net-neutrality-in.html.

Masnick, Mike. “Why Does Rep. Marsha Blackburn Want To Block You From Having Competitive Broadband? | Techdirt.” *Techdirt.*, July 16, 2014.

https://www.techdirt.com/articles/20140716/09525527897/why-does-rep-marsha-blackburn-want-to-block-you-having-competitive-broadband.shtml.

Mattelart, Armand. *The Information Society: An Introduction*. London; Thousand Oaks, Calif.: Sage, 2003.

Mayo, John W., Marius Schwartz, Bruce Owen, Robert Shapiro, Lawrence J. White, and Glenn Woroch. "How to Regulate the Internet Tap." *The New York Times*, April 21, 2010, sec. Opinion. http://www.nytimes.com/2010/04/21/opinion/21mayo.html.

"McCain Introduces Bill to Block FCC's Net Neutrality Rules." *Reuters*, October 22, 2009. http://www.reuters.com/article/2009/10/22/urnidgns002570f3005978d8852576570055da-idUS348124681720091022.

McChesney, Robert W., and Dan Schiller. *The Political Economy of International Communications: Foundations for the Emerging Global Debate about Media Ownership and Regulation*. Programme Paper No. 11. Geneva, Switzerland: United Nations Research Institute for Social Development, Technology, Business and Society, 2003. UNRISD.

McCormick, Rich. "FCC Chairman Reportedly Revises Net Neutrality Proposal after Public Outcry." *The Verge*, May 11, 2014. http://www.theverge.com/2014/5/11/5708402/fcc-chairman-wheeler-revises-net-neutrality-proposal-after-outcry.

McCullagh, Declan. "Telco Agrees to Stop Blocking VoIP Calls - CNET News." *CNET*, March 3, 2005. http://news.cnet.com/Telco-agrees-to-stop-blocking-VoIP-calls/2100-7352_3-5598633.html.

McKelvey, Fenwick. "Ends and Ways: The Algorithmic Politics of Network Neutrality. (English)." *Global Media Journal: Canadian Edition* 3, no. 1 (March 2010): 51–73.

McMillan, Robert. "The Case for Net Neutrality's Nuclear Option." *WIRED*, June 27, 2014. http://www.wired.com/2014/06/common-carrier/.

McSherry, Corynne. "Forbearance: What It Is, Why It's Essential to Net Neutrality." *Electronic Frontier Foundation*, July 1, 2014. https://www.eff.org/deeplinks/2014/07/forbearance-what-it-why-its-essential-net-neutrality-0.

———. "Is Net Neutrality a FCC Trojan Horse?" *Electronic Frontier Foundation Deeplinks*, October 21, 2009. https://www.eff.org/deeplinks/2009/09/net-neutrality-fcc-perils-and-promise.

———. “The FCC and Net Neutrality: A Way Forward.” *Electronic Frontier Foundation*, June 30, 2014. https://www.eff.org/deeplinks/2014/06/fcc-and-net-neutrality-way-forward.

Milner, Murray. “Playing the Telecommunications Game in New Zealand.” *Telecommunications Journal of Australia* 59, no. 2 (2009).

Mitchell, Dan. “Comcast-TWC Merger Might Help the Cause of Net Neutrality - Fortune.” *Fortune Magazine*, February 13, 2014. http://fortune.com/2014/02/13/comcast-twc-merger-might-help-the-cause-of-net-neutrality/.

Morozov, Evgeny. “Freedom.gov,” January 2011. http://www.foreignpolicy.com/articles/2011/01/02/freedomgov.

———. “Passing Through.” *Boston Review*, April 2011. http://www.bostonreview.net/BR36.2/evgeny_morozov_net_neutrality.php.

———. *The Net Delusion: The Dark Side of Internet Freedom*. New York, NY: PublicAffairs, 2011.

Mosco, Vincent. *The Political Economy of Communication*. Los Angeles: Sage Publications, 2009. http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=396515.

Moses, Lyria Bennett. “Creating Parallels in the Regulation of Content: Moving from Offline to Online.” *University of New South Wales Law Journal* 33, no. 2 (August 2010): 581–604.

Moustafa, Hassnaa, and Sherali Zeadally. *Media Networks Architectures, Applications, and Standards*. Boca Raton, FL: CRC Press, 2012. http://www.crcnetbase.com/isbn/978-1-4398-7728-9.

Mueller, Milton L. “Property and Commons in Internet Governance.” In *Governance, Regulations and Powers on the Internet*, edited by Eric Brousseau, Meryem Marzouki, and Cécile Méadel. Cambridge ; New York: Cambridge University Press, 2012.

Mueller, Milton L., and Hagi Asghari. “Deep Packet Inspection and Bandwidth Management: Battles over BitTorrent in Canada and the United States.” *Telecommunications Policy* 36 (July 2012): 462–75. doi:10.1016/j.telpol.2012.04.003.

Mueller, Milton, John Mathiason, and Hans Klein. “The Internet and Global Governance: Principles and Norms for a New Regime.” *Global Governance: A Review of Multilateralism and International Organizations* 13, no. 2 (2007): 237–54.

Nagesh, Gautham. “FCC’s Net-Neutrality Proposal Faces Public Backlash.” *The Wall Street Journal*, July 14, 2014. http://online.wsj.com/articles/fccs-net-neutrality-proposal-faces-public-backlash-1405381100?mod=LS1.

———. “Internet Users Mobilize as FCC Prepares Net Neutrality Plan.” *Wall Street Journal*, April 30, 2014, sec. Tech. http://online.wsj.com/news/articles/SB10001424052702304893404579531910717735116?mg=reno64-wsj&url=http%3A%2F%2Fonline.wsj.com%2Farticle%2FSB10001424052702304893404579531910717735116.html.

NCTA. “Our Opinion on ‘The Opinion.’” *Cable Tech Talk*, January 14, 2014. https://www.ncta.com/platform/public-policy/our-opinion-on-the-opinion/.

———. “What’s at Stake When the Open Internet Goes on Trial?” *NCTA - Cable Tech Talk*, September 9, 2013. https://www.ncta.com/platform/public-policy/whats-at-stake-when-the-open-internet-goes-on-trial/.

———. “Why It’s a Good Thing That Broadband Isn’t a Common Carrier.” *Cable Tech Talk*, January 27, 2014. https://www.ncta.com/platform/public-policy/why-its-a-good-thing-that-broadband-isnt-a-common-carrier/.

Netflix. “Letter to Investors,” January 22, 2014. http://files.shareholder.com/downloads/NFLX/2913680097x0x720306/119321bc-89c3-4306-93ac-93c02da2354f/Q4%2013%20Letter%20to%20shareholders.pdf.

NETmundial. “NETmundial Multistakeholder Statement.” Global Multistakeholder Meeting on the Futre of Internet Governance, April 24, 2014. http://netmundial.br/wp-content/uploads/2014/04/NETmundial-Multistakeholder-Document.pdf.

Noam, Eli. “Overcoming the Three Digital Divides.” *International Communication: A Reader*, 2010, 48–55.

———. “Towards the Federated Internet.” *Intermedia (0309118X)* 41, no. 4 (September 2013): 10–13.

Noam, Eli M. “Beyond Liberalization II: The Impending Doom of Common Carriage.” *Telecommunications Policy* 18, no. 6 (August 1994): 435–52.

———. “Beyond Net Neutrality: End-User Sovereignty.” *Communications and Strategies*, no. 84 (2011): 153–73.

Nunziato, Dawn C. *Virtual Freedom : Net Neutrality and Free Speech in the Internet Age*. Stanford, Calif.: Stanford Law Books, 2009.

O'brien, Kevin J. "Dutch Lawmakers Adopt Net Neutrality Law." *The New York Times*, June 22, 2011, sec. Technology. http://www.nytimes.com/2011/06/23/technology/23neutral.html.

Obama, Barack. "Remarks by the President on Securing Our Nation's Cyber Infrastructure." Remarks, The White House, Washington, D.C., May 29, 2009. http://www.whitehouse.gov/the_press_office/Remarks-by-the-President-on-Securing-Our-Nations-Cyber-Infrastructure/.

Odell, John S. "Case Study Methods in International Political Economy." *International Studies Perspectives* 2, no. 2 (May 2001): 161.

OECD. "OECD Broadband Statistics Update." *Organisation for Economic Co-Operation and Development*, July 22, 2014. http://www.oecd.org/sti/broadband/broadband-statistics-update.htm.

———. *OECD Communications Outlook 2013*. Paris: OECD Publishing, 2013. http://public.eblib.com/EBLPublic/PublicView.do?ptiID=1336580.

Olmstead, Kenneth, Paul Hitlin, and Nancy Vogt3 comments. "Net Neutrality: A Made-for-Web Debate." *Pew Research Center*, May 15, 2014. http://www.pewresearch.org/fact-tank/2014/05/15/net-neutrality-a-made-for-web-debate/.

Olsen-Phillips, Peter. "Obama Bundler Tom Wheeler Helps His Former Industry from FCC Perch." *Sunlight Foundation*, April 24, 2014. http://sunlightfoundation.com/blog/2014/04/24/obama-bundler-tom-wheeler-helps-his-former-industry-from-fcc-perch/.

Open MIC. "Comment of Open Media and Information Companies Initiative (Open MIC), et Al Submitted before the Federal Communicaions Commission in the Matter of Proposed Rulemaking Promoting and Protecting the OPen Internet GN Docket No. 14-28." Open MIC, July 14, 2014. http://openmic.org/files/Open%20MIC%20et%20al_GN%20Docket%20No.%2014-28_Comment.pdf?utm_source=Investors+Urge+FCC+to+Adopt+Net+Neutrality+Rules%2C+Reclassify+Broadband+Internet+&utm_campaign=Privacy&utm_medium=email.

Patel, Nilay. "The Wrong Words: How the FCC Lost Net Neutrality and Could Kill the Internet." *The Verge*, January 15, 2014. http://www.theverge.com/2014/1/15/5311948/net-neutrality-and-the-death-of-the-internet.

Peha, Jon M. *The Benefits and Risks of Mandating Network Neutrality, and the Quest for a Balanced Policy*. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, August 15, 2006. http://papers.ssrn.com/abstract=2103831.

Pouwelse, Johan A., Pawel Garbacki, Dick Epema, and Henk Sips. "Pirates and Samaritans: A Decade of Measurements on Peer Production and Their Implications for Net Neutrality and Copyright." *Telecommunications Policy*, Future Telecommunications Regulation: A Dutch Perspective Future Telecommunications Regulation, 32, no. 11 (December 2008): 701–12. doi:10.1016/j.telpol.2008.09.004.

Powell, Michael K. C-SPAN: The Communicators: Michael Powell. Interview by Gautham Nagesh. Video, June 9, 2014. http://www.c-span.org/video/?319786-1/communicators-michael-powell.

Powers, Shawn, and Michael Jablonski. *The Real CyberWar: The Political Economy of Internet Freedom*. University of Illinois Press, 2014.

Powles, Julia. "Big Business Was the Winner at NETmundial." *Wired UK*, April 28, 2014. http://www.wired.co.uk/news/archive/2014-04/28/internet-diplomacy-netmundial.

Price, Monroe. *Media and Sovereignty*. Cambridge, Mass.: MIT Press, 2002.

Puzzanghera, Jim. "FCC Won't Appeal Net Neutrality Ruling, Will Again Try to Rewrite Rules." *Los Angeles Times*, February 19, 2014. http://www.latimes.com/business/technology/la-fi-tn-net-neutrality-fcc-internet-20140219,0,5866007.story#axzz2uMqShu1C.

Quail, Christine, and Christine Larabie. "Net Neutrality: Media Discourses and Public Perception." *Global Media Journal: Canadian Edition* 3, no. 1 (March 2010): 31–50.

Raboy, Marc. "The WSIS as a Political Space in Global Media Governance." *Continuum: Journal of Media & Cultural Studies* 18, no. 3 (2004): 345–59.

Ramachandran, Shalini. "Netflix to Pay Comcast to End Traffic Jam." *The Wall Street Journal*, February 23, 2014. http://www.marketwatch.com/story/netflix-agrees-to-pay-comcast-to-improve-its-streaming-2014-02-23-124491012.

Rayburn, Dan. "Chart Shows Which Content Owners Have Direct Interconnect Deals With ISPs." *Streaming Media Blog*, May 21, 2014. http://blog.streamingmedia.com/2014/05/chart-shows-which-content-owners-have-direct-interconnect-deals-with-isps.html.

Reardon, Marguerite. “FCC Approves AT&T-BellSouth Merger.” *CNET*, December 29, 2006. http://news.cnet.com/FCC-approves-ATT-BellSouth-merger/2100-1036_3-6146369.html.

Reed, Brad. “Cable Companies’ ‘Comically Profitable’ Margins Said to Provide Little Incentive to Invest in Fiber.” *BGR*, February 6, 2013. http://bgr.com/2013/02/06/cable-company-internet-service-margins-316532/.

Reilly, Claire. “TPG Brings Unlimited Data to NBN Users with New Plans.” *CNET*, April 14, 2014. http://www.cnet.com/au/news/tpg-brings-unlimited-data-to-nbn-users-with-new-plans/.

Samuels, Julie. “What’s Next for Net Neutrality?: Don’t Harm the Start-Up Economy.” *The New York Times*, May 15, 2014. http://www.nytimes.com/roomfordebate/2014/05/15/whats-next-for-net-neutrality/without-net-neutrality-start-ups-will-suffer.

Sandvig, Christian. “Network Neutrality Is the New Common Carriage.” *Info : The Journal of Policy, Regulation and Strategy for Telecommunications, Information and Media* 9, no. 2/3 (2007): 136–47. doi:http://dx.doi.org/10.1108/14636690710734751.

Sandvine. *Global Internet Phenomena Report 1H 2014*, May 15, 2014. https://www.sandvine.com/trends/global-internet-phenomena/.

Sasso. “Forget the FCC—Should the FTC Enforce Net Neutrality?,” June 20, 2014. http://www.nationaljournal.com/tech/forget-the-fcc-should-the-ftc-enforce-net-neutrality-20140620.

Schaake, Marietje. “A Digital Future Needs Real Net Neutrality.” *Neurope.eu*, November 10, 2013. http://www.neurope.eu/article/digital-future-needs-real-net-neutrality.

Schiller, Dan. *How to Think about Information*. 1st Edition. University of Illinois Press, 2010.

Schmidt, Eric, and Jared Cohen. *The New Digital Age: Reshaping the Future of People, Nations and Business*. First edition., 2013.

“Sender-Side Transmission Rules for the Internet,” April 14, 2014. FCC Electronic Comment Filing SYstem. http://apps.fcc.gov/ecfs/comment/view?id=6017611807.

Shah, Rajiv C., and Jay P. Kesan. “The Privatization of the Internet’s Backbone Network.” *Journal of Broadcasting & Electronic Media* 51, no. 1 (March 2007): 93–109. doi:10.1080/08838150701308077.

Shahani, Aarti. "A Year After Snowden, U.S. Tech Losing Trust Overseas." *NPR.org*, June 5, 2014. http://www.npr.org/blogs/alltechconsidered/2014/06/05/318770896/a-year-after-snowden-u-s-tech-losing-trust-overseas.

Shields, Todd. "Google's Growing Silence on Saving Open Internet Leaves Fight to Startups." *Bloomberg*, July 7, 2014. http://www.bloomberg.com/news/2014-07-08/google-waning-on-net-neturality-leaves-fight-to-startups.html.

Silberman, Laurence H., Judith Ann Wilson Rogers, and David S. Tatel. Verizon Communications Inc. v. Federal Communications Commission (2014), (United States Court of Appeals for the District of Columbis Circuit 2014).

Silver, Joe. "Hundreds Protest Outside FCC Net Neutrality Hearing." *Ars Technica*, May 15, 2014. http://arstechnica.com/tech-policy/2014/05/hundreds-protest-outside-fcc-net-neutrality-hearing/.

Snider, Mike. "FCC Chairman Grilled at House Subcommittee Hearing." *USA Today*, May 20, 2014, sec. Tech. http://www.usatoday.com/story/tech/2014/05/20/house-fcc-chairman-wheeler-net-neutrality/9328489/.

Solit, John. "Powell on C-SPAN Discussing Netflix, Net Neutrality, and Title II." *NCTA - Cable Tech Talk*, June 13, 2014. https://www.ncta.com/platform/industry-news/powell-on-c-span-discussing-netflix-net-neutrality-and-title-ii/.

Staff, and agencies. "Google, Facebook and Amazon Write to FCC Demanding True Net Neutrality." *The Guardian*, May 7, 2014, sec. Technology. http://www.theguardian.com/technology/2014/may/08/google-facebook-and-amazon-sign-letter-criticising-fcc-net-neutrality-plan.

Starke, Peter. "Qualitative Methods for the Study of Policy Diffusion: Challenges and Available Solutions." *Policy Studies Journal* 41, no. 4 (November 2013): 561–82. doi:10.1111/psj.12032.

Stearns, Josh. "Net Neutrality and the Future of Journalism." *Free Press*, January 15, 2014. http://www.freepress.net/blog/2014/01/15/net-neutrality-and-future-journalism.

Stevenson, John Harris, and Andrew Clement. "Regulatory Lessons for Internet Traffic Management from Japan, the European Union, and the United States: Toward Equity, Neutrality, and Transparency." *Global Media Journal: Canadian Edition* 3, no. 1 (March 2010): 9–29.

Talbot, David. "Comcast, Verizon Wireless, and Time Warner Cable. When Will the Rest of Us Get Google's Gigabit-per-Second Service?" *MIT Technology Review*,

February 4, 2013. http://www.technologyreview.com/news/510176/when-will-the-rest-of-us-get-google-fiber/.

———. "Google Fiber Apparently Is Driving Up Internet Speeds Offered by Competitors." *MIT Technology Review*, April 2013. http://www.technologyreview.com/news/514176/google-fibers-ripple-effect/.

———. "In Developing Countries, Google and Facebook Already Defy Net Neutrality." *MIT Technology Review*, January 20, 2014. http://www.technologyreview.com/news/523736/around-the-world-net-neutrality-is-not-a-reality/.

Tassi, Paul. "Reddit's SOPA Blackout Admirable, But Google and Facebook Must Follow - Forbes," January 11, 2012. http://www.forbes.com/sites/insertcoin/2012/01/11/reddits-sopa-blackout-admirable-but-google-and-facebook-must-follow/.

Taylor, Josh. "Australia Drops in OECD Broadband Rankings." *ZDNet*, July 23, 2014. http://www.zdnet.com/au/australia-drops-in-oecd-broadband-rankings-7000031893/.

Thierer, Adam. "Are Dumb Pipe Mandates Smart Public Policy - Vertical Integration, Net Neutrality, and the Network Layers Model." *Journal on Telecommunications & High Technology Law* 3 (2005 2004): 275.

———. "'Net Neutrality' Digital Discrimination or Regulatory Gamesmanship in Cyberspace?" *Cato Policy Analysis*, no. 507 (January 12, 2004). http://www.cato.org/pubs/pas/pa-507es.html.

Thierer, Adam, and Berin Szoka. "Cyber-Libertarianism: The Case for Real Internet Freedom." *Technology Liberation Front*, August 12, 2009. http://techliberation.com/2009/08/12/cyber-libertarianism-the-case-for-real-internet-freedom/.

Thomas. "When Digital Was New: The Advanced Television Technologies of the 1970s and the Control of Content." In *Television as Digital Media*, edited by James Bennett and Niki Strange. Durham, NC: Duke University Press, 2011.

Tucker, Rodney S. "The Rise and Fall of Australia's $44 Billion Broadband Project - IEEE Spectrum." *IEEE Spectrum*, November 26, 2013. http://spectrum.ieee.org/telecom/internet/the-rise-and-fall-of-australias-44-billion-broadband-project.

Tummarello, Kate. "Net neutrality nightmare unlikely, Netflix says." Text. *TheHill*, January 22, 2014. http://thehill.com/blogs/hillicon-valley/technology/196158-net-neutrality-nightmare-unlikely-netflix-says.

Turilli, Matteo, Antonino Vaccaro, and Mariarosaria Taddeo. "Internet Neutrality: Ethical Issues in the Internet Environment." *Philosophy & Technology* 25, no. 2 (June 2012): 133.

Turner, Adam. "Net Neutrality - a Debate We Can't Afford to Ignore." *The Sydney Morning Herald*, February 26, 2014. http://www.smh.com.au/digital-life/computers/blog/gadgets-on-the-go/net-neutrality--a-debate-we-cant-afford-to-ignore-20140226-33hco.html.

Turner, Fred. *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*. Chicago: University of Chicago Press, 2006.

Tussey, Ethan, and Kevin Sanson. "Infrastructure Disputes Shape Future of Streaming Media." *Carsey-Wolf Center Media Industries Project*, December 1, 2011. http://www.carseywolf.ucsb.edu/mip/article/infrastructure-disputes-shape-future-streaming-media.

Tuten, Tracy L. "Field Observations and Case Studies." In *Research Methods in Communication*, edited by Shuhua Zhou and W. David Sloan. Northport, AL: Vision Press, 2011.

Tweney, Dylan. "Sept. 24, 1979: First Online Service for Consumers Debuts | This Day in Tech." *WIRED*, September 24, 2009. http://www.wired.com/2009/09/0924compuserve-launches.

Vaidhyanathan, Siva. *The Googlization of Everything: (and Why We Should Worry)*. Berkeley: University of California Press, 2011.

Van Beijnum, Iljitsch. "Netherlands Becomes World's Second 'Net Neutrality' Country." *Ars Technica*, May 10, 2012. http://arstechnica.com/tech-policy/2012/05/netherlands-becomes-worlds-second-net-neutrality-country/.

Van Schewick, Barbara. *Towards an Economic Framework for Network Neutrality Regulation*. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, 2007. http://papers.ssrn.com/abstract=812991.

Verizon v. FCC, 740 F. 3d 623 (Court of Appeals, Dist. of Columbia Circuit 2014).

Wagstaff, Keith. "Verizon Wins, Net Neutrality Loses, as Court Ruling Opens Door to a Tiered Internet - NBC News.com." *NBC News*, January 14, 2014. http://www.nbcnews.com/technology/verizon-wins-net-neutrality-loses-court-ruling-opens-door-tiered-2D11922702.

Wallsten, Scott, and Stephanie Hausladen. "Net Neutrality, Unbundling, and Their Effects on International Investment in Next-Generation Networks." *Review of Network Economics* 8, no. 1 (March 1, 2009).

http://www.degruyter.com/view/j/rne.2009.8.1/rne.2009.8.1.1171/rne.2009.8.1.1171.xml.

Wei, Ran. "New Media Research." In *Research Methods in Communication*, edited by Shuhua Zhou and W. David Sloan. Northport, AL: Vision Press, 2011.

Weisman, Dennis L., and Glen O. Robinson. "Lessons for Modern Regulators from Hippocrates, Schumpeter and Kahn." In *New Directions in Communications Policy*, edited by Randolph J May. Durham, N.C.: Carolina Academic Press, 2009.

Wheeler, Thomas. "Statement by FCC Chairman Tom Wheeler on the FCC's Open Internet Rules." *FCC.gov*, February 19, 2014. http://www.fcc.gov/document/statement-fcc-chairman-tom-wheeler-fccs-open-internet-rules.

———. *Statement of FCC Chairman Tom Wheeler House Oversight Hearing Testimony*. Washington, DC: Federal Communication Commission, 2014. http://www.fcc.gov/document/fcc-chairman-tom-wheeler-house-oversight-hearing-testimony.

White, Aoife, and Angeline Benoit. "'Google It' Becomes 'Hide It' After Right to Be Forgotten." *Bloomberg*, July 10, 2014. http://www.bloomberg.com/news/2014-07-09/-google-it-becomes-hide-it-after-right-to-be-forgotten.html.

White House. *A Framework for Global Electronic Commerce*. Washington, DC: The White House, July 1, 1997. http://clinton4.nara.gov/WH/New/Commerce/.

Whitt, Richard S. "A Deference to Protocol: Fashioning a Three-Dimensional Public Policy Framework for the Internet Age." *Cardozo Arts & Entertainment Law Journal* 31, no. 3 (July 2013): 689–768.

Wilson, Fred. "VC Pitches In A Year Or Two." *AVC*, January 15, 2014. http://www.avc.com/a_vc/2014/01/vc-pitches-in-a-year-or-two.html.

Winseck, Dwayne. "New Zealand's Ultra-Fast Broadband Plan: Digital Public Works Project for the Twenty-First Century or Playfield of Incumbent Interests?" *Media International Australia (8/1/07-Current)*, no. 151 (May 2014): 157–70.

Winseck, Dwayne R., and Robert M. Pike. "Communication and Empire Media Markets, Power and Globalization, 1860—1910." *Global Media and Communication* 4, no. 1 (April 1, 2008): 7–36. doi:10.1177/1742766507086850.

Winterford, Brett, Julian Hill, and 2008-- 06:36 Gmt. "Net Neutrality Is an 'American Problem.'" *ZDNet*, September 24, 2008. http://www.zdnet.com/net-neutrality-is-an-american-problem-1339292161/.

Winther, Mark. *Tier 1 ISPs: What They Are and Why They Are Important*. White Paper. Intenational Data Corporation and NTT Communications, May 2006.

Wu, Tim. "Network Neutrality, Broadband Discrimination." *Journal on Telecommunications & High Technology Law* 2 (2003): 141.

———. *The Master Switch: The Rise and Fall of Information Empires*. New York: Alfred A. Knopf, 2010. http://www.contentreserve.com/TitleInfo.asp?ID={2BDB149B-1432-4B87-867F-7ACFAD6999AA}&Format=410.

———. "When Code Isn't Law." *Virginia Law Review*, 2003.

Wu, Tim, and Christopher Yoo. "Keeping the Internet Neutral?: Tim Wu and Christopher Yoo Debate." *59 Federal Communications Law Journal 575 (2007)* 59, no. 3 (June 1, 2007). http://www.repository.law.indiana.edu/fclj/vol59/iss3/6.

Wyatt, Edward. "Google and Verizon Near Deal on Pay Tiers for Web." *The New York Times*, August 4, 2010, sec. Technology. http://www.nytimes.com/2010/08/05/technology/05secret.html.

———. "In Policy Shift, F.C.C. Will Allow A Web Fast Lane." *The New York Times*, April 23, 2014. http://www.nytimes.com/2014/04/24/technology/fcc-new-net-neutrality-rules.html.

———. "Rebuffing F.C.C. in 'Net Neutrality' Case, Court Allows Streaming Deals." *The New York Times*, January 14, 2014. http://www.nytimes.com/2014/01/15/technology/appeals-court-rejects-fcc-rules-on-internet-service-providers.html.

———. "U.S. Court Curbs F.C.C. Authority on Web Traffic." *The New York Times*, April 6, 2010, sec. Technology. http://www.nytimes.com/2010/04/07/technology/07net.html.

———. "Verizon Sues F.C.C. over Order on Blocking Web Sites." *The New York Times*, January 20, 2011, sec. Business Day / Media & Advertising. http://www.nytimes.com/2011/01/21/business/media/21fcc.html.

Yang, Guobin. *The Power of the Internet in China: Citizen Activism Online*. New York: Columbia University Press, 2011.

Yin, Robert K. *Case Study Research: Design and Methods*. SAGE Publications, 2013.

Yoo, Christopher. "Is There a Role for Common Carriage in an Internet-Based World?" *Faculty Scholarship*, January 1, 2013. http://scholarship.law.upenn.edu/faculty_scholarship/567.

Yoo, Christopher S. "Innovations in the Internet's Architecture That Challenge the Status Quo." *Journal on Telecommunications and High Technology Law* 8 (2010): 79.

———. "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management." In *New Directions in Communications Policy*, edited by Randolph J May. Durham, N.C.: Carolina Academic Press, 2009.

———. "Network Neutrality after Comcast: Toward a Case-by-Case Approach to Reasonable Network Management." In *New Directions in Communications Policy*, edited by Randolph J. May. Durham, N.C: Carolina Academic Press, 2009.

———. "Network Neutrality and the Economics of Congestion." *Georgetown Law Journal* 94 (June 2006). http://papers.ssrn.com/abstract=825669.

———. *U.S. vs. European Broadband Deployment: What Do the Data Say?* University of Pennsylvania Law School, June 2014.

Youmans, William Lafi, and Jillian C. York. "Social Media and the Activist Toolkit: User Agreements, Corporate Interests, and the Information Infrastructure of Modern Social Movements." *Journal of Communication* 62, no. 2 (2012): 315–29.

Zelnick, Robert. *The Illusion of Net Neutrality: Political Alarmism, Regulatory Creep, and the Real Threat to Internet Freedom*. Hoover Institution Press Publication, no. 633. Stanford, California: Hoover Institution Press, Stanford University, 2013.

Zhu, Kai. "Bringing Neutrality to Network Neutrality." *Berkeley Technology Law Journal* 22 (January 1, 2007): 615.

Zickuhr, Kathryn, and Aaron Smith. *Home Broadband 2013*. Pew Internet & American Life Project, August 26, 2013. http://www.pewinternet.org/Reports/2013/Broadband/Findings.aspx.

Ziegler, Chris. "T-Mobile's 'Music Freedom' Is a Great Feature — and a Huge Problem | The Verge." *The Verge*, June 18, 2014. http://www.theverge.com/2014/6/18/5822996/t-mobile-music-freedom-net-neutrality.

Zittrain, Jonathan. *Net Neutrality as Diplomacy*. SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, December 23, 2010. http://papers.ssrn.com/abstract=1729424.

———. "What Matters in Net Neutrality." *Future of the Internet – And How to Stop It.*, August 9, 2010. http://blogs.law.harvard.edu/futureoftheinternet/2010/08/09/what-matters-in-net-neutrality/.

Zuckerman, Ethan. “The Cute Cat Theory Talk at ETech.” *... My Heart’s in Accra*, March 8, 2008. http://www.ethanzuckerman.com/blog/2008/03/08/the-cute-cat-theory-talk-at-etech/.